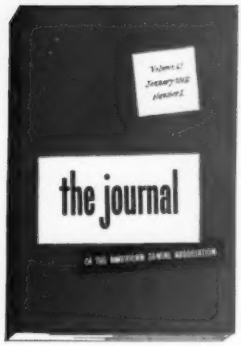
Volume 62
June 1961
Number 6

the journal

OF THE AMERICAN DENTAL ASSOCIATION



June 1961 • Vol. 62 • No. 6 • Lon W. Morrey, D.D.S., Editor

in this issue

Changes in dentures during storage in water and in service—Woelfel-Paffenbarger-Sweeney 643
The intramucosal insert—Cranin-Cranin 658
Vehicle for application of drugs to oral mucous membranes—Kutscher-Zegarelli-Roland-Chilton-Mercadante 666
Silicate cements and pulpal degeneration—Roydhouse 670
Personality factors in use of hypnosis in dentistry—Shaw 675
How the budget plan has affected my practice—Rutledge 680
Dental service for poliomyelitis patients—Carney-Merrill 683
Odontogenic synalgia and muscle action potentials—Ogle 687
Personality characteristics in patients with temporomandibular joint symptoms—McCall-Szmyd-Ritter 694
Miniature wax sculpturing—Harrison 699
Exodontia for a patient with sickle cell anemia—Matson 704
Experimental lesions in bone: II—Bender-Seltzer 708
Role of prevention in military dentistry—Bernier-McFall 717
Editorials 723
State society presidents 726
News of dentistry 728
International dentistry 746
Association staff members 750
Reports of councils and bureaus 752
Directory and announcements 780
Index to advertisements 238

in the next issue

To educate and to be educated—Fogarty
Relation of mercury to amalgam restoration: I—Nadal-Phillips-Swartz
Viral hepatitis in relation to dentistry—Knighton

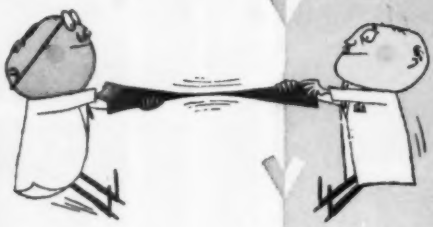
in future issues look for

Preliminary program, 1961 annual session, American Dental Association
The next great areas for teamwork in national health—Terry
Clinical trials of caries inhibitory dentifrices—Kyes-Overton-McKean

The Journal of the American Dental Association is published monthly by the American Dental Association at 222 E. Superior St., Chicago 11, Ill. Printed in U.S.A. Second class mail privileges authorized at Chicago, Ill. Subscription $7.00 a year in U.S.A.; $8.00 foreign. Issue of June, 1961, Vol. 62 No. 6. Copyright 1961 by the American Dental Association.

The Little Professor Says...

High percentage of elongation (ductility) is necessary in a good inlay gold because it makes it more workable yet still provides adequate toughness.



MOD® MODULAY

Is Better Because It's More Workable!

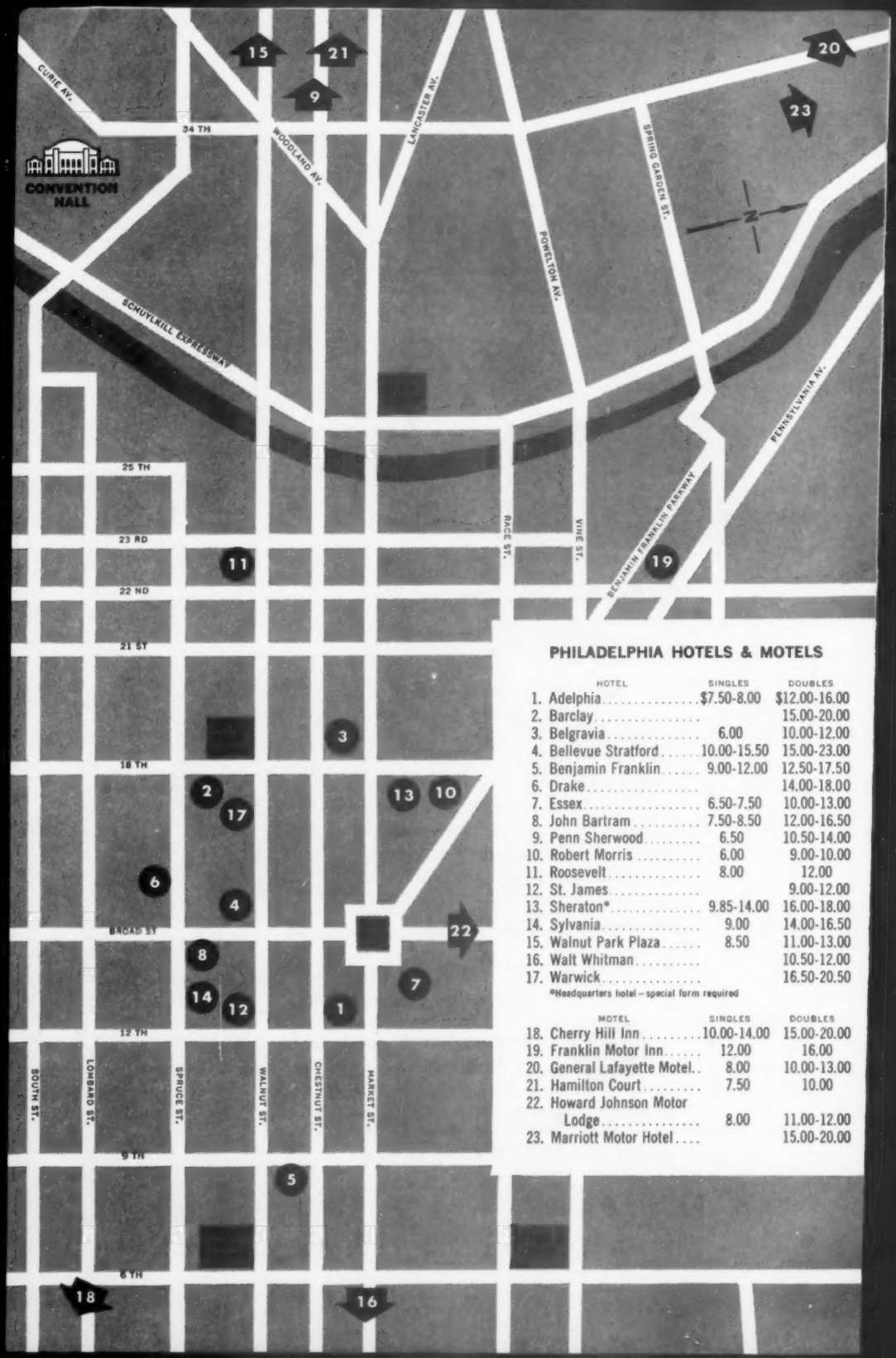
New, improved physical properties for all Jelenko Casting Golds have given popular Modulay much greater ductility thus providing far greater workability. Now, more than ever before, Modulay embodies nicely balanced physical properties which provide the hardness needed to stand up under occlusal abrasion and greater ductility to permit drawing the margins to a feather edge.

Write for your new physical property chart today.

Popularly Priced at $2.15 per Dwt.

J. F. JELENKO & CO., INC.

136 WEST 52nd STREET, NEW YORK 19, U.S.A.



PHILADELPHIA HOTELS & MOTELS

HOTEL	SINGLES	DOUBLES
1. Adelphia	$7.50-8.00	$12.00-16.00
2. Barclay		15.00-20.00
3. Belgravia	6.00	10.00-12.00
4. Bellevue Stratford	10.00-15.50	15.00-23.00
5. Benjamin Franklin	9.00-12.00	12.50-17.50
6. Drake		14.00-18.00
7. Essex	6.50-7.50	10.00-13.00
8. John Bartram	7.50-8.50	12.00-16.50
9. Penn Sherwood	6.50	10.50-14.00
10. Robert Morris	6.00	9.00-10.00
11. Roosevelt	8.00	12.00
12. St. James		9.00-12.00
13. Sheraton*	9.85-14.00	16.00-18.00
14. Sylvania	9.00	14.00-16.50
15. Walnut Park Plaza	8.50	11.00-13.00
16. Walt Whitman		10.50-12.00
17. Warwick		16.50-20.50

*Headquarters hotel – special form required

MOTEL	SINGLES	DOUBLES
18. Cherry Hill Inn	10.00-14.00	15.00-20.00
19. Franklin Motor Inn	12.00	16.00
20. General Lafayette Motel	8.00	10.00-13.00
21. Hamilton Court	7.50	10.00
22. Howard Johnson Motor Lodge	8.00	11.00-12.00
23. Marriott Motor Hotel		15.00-20.00

application for housing accommodations

102nd Annual Session, American Dental Association
October 16-19, 1961 — Philadelphia

- Reservation requests for housing accommodations should be made by completing this application and mailing it to A.D.A. Housing Bureau, P.O. Box 5440, Chicago 7.
- *Make your reservation now!* Assignments will be made in order received.
- Scientific session and exhibits will be held in the Convention Hall. Meetings of the House of Delegates will be in the Sheraton Hotel.
- Indicate the date you will arrive in Philadelphia and check the form of transportation you will use as well as the departure time.
- Reservations will be held only until 6 p.m. of the day of arrival unless specific arrangements are made with the hotel or motel.
- If rooms listed are not available, an assignment will be made, whenever possible, to a hotel or motel in the same area.

American Dental Association Housing Bureau, P.O. Box 5440, Chicago 7

PLEASE PRINT OR TYPE

Name of applicant_____

STREET ADDRESS _____ CITY _____ ZONE _____ STATE _____

Date Arriving_____ via ☐ Auto ☐ Plane ☐ Train Date Leaving_____

accommodations

Hotel_____ FIRST CHOICE

Hotel_____ SECOND CHOICE

Hotel_____ THIRD CHOICE

Hotel_____ FOURTH CHOICE

Motel_____ FIRST CHOICE

Motel_____ SECOND CHOICE

☐ Single occupancy, rate to range from $_____ to $_____ per day.
☐ Double occupancy, double bed, rate to range from $_____ to $_____ per day. } 2 names must
☐ Double occupancy, twin beds, rate to range from $_____ to $_____ per day. } be listed below
☐ Suite of_____rooms, including parlor, rate to range from $_____ to $_____ per day.

Rooms will be occupied by:

NAME _____ ADDRESS _____ CITY _____ STATE _____

NAME _____ ADDRESS _____ CITY _____ STATE _____

PICTURE BOOK PREPARATIONS

but will your filling material do them justice?

they'll look right — and last — when you use

ACHATITE

reinforced silicate filling material

You get the lifelike look of natural teeth . . . plus strength that resists breakage — even on corners and incisal edges . . . exceptional resistance to stain, discoloration, washout . . . and real packing ease.

ACHATITE picks up shades of adjacent tooth structure to make shade blending simpler than ever before.

SATISFACTION GUARANTEED

Order through your ACHATITE dealer today or write for detailed literature

ACHATITE is on the list of Certified Dental Materials

VIVADENT CORP.
30 PINE STREET, WOBURN, MASS.

FOR JACKETS, CROWNS AND BRIDGEWORK

Tenet

the smoooooth zinc phosphate cement

preserves tooth-color harmony

Try TENET — and discover the smoothest cement you ever mixed. It allows you ample working time . . . flows like heavy cream . . .

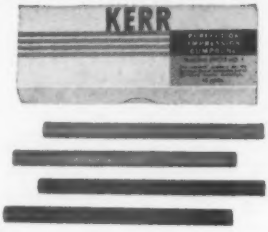
Ask your ACHATITE dealer for your 2/1 TENET package today . . . or write for detailed literature

TENET is another quality product from the manufacturers of ACHATITE, the reinforced silicate for esthetic anterior fillings.

VIVADENT CORP.
30 Pine St., Woburn, Mass.

Try TENET today— you'll see and feel the difference!

12=14 / 6=7?



14
-12
2

Mathematically puzzling . . . but economically pleasing! Twelve=fourteen, because for the ordinary low price you normally pay for 12 boxes of top quality Kerr Impression Compound Cakes you get 14 boxes.

7
-6
1

Equally pleasing—a special offer on Kerr Impression Compound Sticks—6=7, because for the ordinary low price you normally pay for 6 boxes of top quality Kerr Impression Compound Sticks you get 7 boxes.

A Clear No Obligation Bonus

Available in Single Color Packages

FAMOUS KERR COMPOUNDS

COMPOUND CAKES— 2 BOXES FREE

Better than a baker's dozen —two boxes free to you

Red — Green — Black
Gray — White

$11.75 Per Bonus Package

COMPOUND STICKS— 1 BOX FREE

Another bonus package—one box free to you

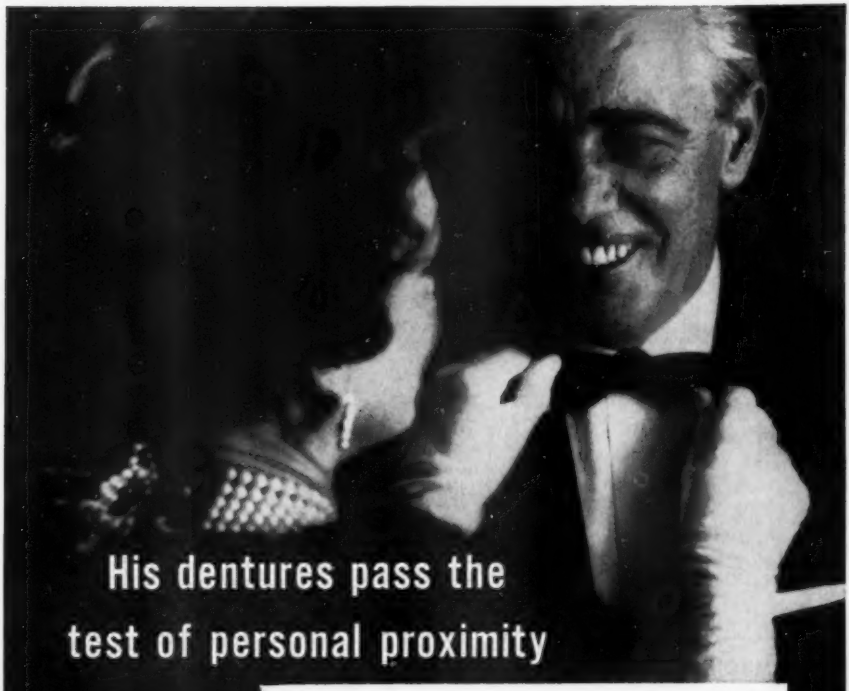
Red and Green only

$6.10 Per Bonus Package

Order now, your Kerr Dealer is ready to provide you with the Kerr Compound bonus packages of your choice . . . containing 2 extra boxes of Compound Cakes or one extra box of Compound Sticks at no additional cost.

KERR *dental progress through* **PROVEN PRODUCTS**

KERR MANUFACTURING COMPANY • SINCE 1891 • DETROIT 8, MICHIGAN



His dentures pass the test of personal proximity

Even at close range, his smile is sparkling, charming, completely attractive. A simple daily soak in Polident removes stains and debris—assures lustrous, natural looking dentures . . . keeps them fresh and odor-free, too.

Recommend Polident to your denture patients: they will appreciate its ease, convenience and safety, plus the continued reassurance that goes with a *really clean* denture.

EASY TO USE 1. Soak 2. Rinse 3. Wear

SAFE TO USE recommended by more dentists than any other denture cleanser.

POLIDENT®

for office supply of samples, write—

BLOCK DRUG COMPANY, INC.

105 Academy Street, Jersey City 2, N.J.

"Quality Products for Dental Health"

FOR ORAL INFECTIONS THE EXTRA ACTIVE BROAD-SPECTRUM ANTIBIOTIC

DECLOMYCIN Demethylchlortetracycline is an improved antibiotic related to AUREOMYCIN® Chlortetracycline and ACHROMYCIN® Tetracycline. It is derived from a mutant strain of *Streptomyces aureofaciens*, source of all three antibiotics.

DECLOMYCIN Demethylchlortetracycline achieves high antibacterial activity in the blood. It is highly stable in body fluids and is excreted at a slow rate.

DECLOMYCIN thus provides full therapeutic action with low antibiotic dosage (only four 150 mg. capsules daily) and sustains peak activity levels.

DECLOMYCIN provides good control of common pathogens and inhibits many strains of bacteria—including several "problem pathogens" which may be found in dental infections. Such conditions are: dento-alveolar abscess, submaxillary cellulitis, postextraction infection, bacterial infection secondary to gingivitis, periodontitis or Vincent's angina.

DECLOMYCIN is unusual because it maintains activity for 24 to 48 hours after the last dose. This "extra" activity protects against resurgence of the primary infection, possible spread into the blood system and secondary complications.

"Extra active" **DECLOMYCIN** another reason for choosing oral broad-spectrum therapy in dental practice.

DECLOMYCIN®

DEMETHYLCHLORTETRACYCLINE LEDERLE

Request complete information on indications, dosage, precautions and contraindications from Medical Advisory Department

LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

NEW Precise-fitting mouth guard for athletes

ORYL-GARD

Oryl-Gard B (Upper)
Protective mouthpiece for boxing and football

Oryl-Gard F (Lower)
Protective mouthpiece for football

PAT. PENDING

the scientifically designed "NEW TYPE MOUTHGUARD" available through the dental profession

We have told thousands of high school and college coaches the IMPORTANCE of having dentists professionally fit ORYL-GARD protective mouthpieces.

... and that accurate fitting can BEST be accomplished by a dentist.

It requires only a few minutes to fit ORYL-GARD. The specially compounded, extra tough, thin flexible plastic shell, is filled with a velum type plastic and fitted over the LOWER TEETH. The bite is closed to register comfortable occlusal contact while the material sets.

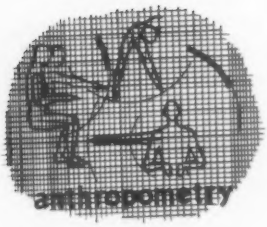
ADVANTAGES:

- The fast, easy technique is described in the ORYL-GARD manual.
- Complete fitting is done in the dental office or school gym. No laboratory work is necessary.
- It's easier to breath when wearing ORYL-GARD.
- Fits with impression accuracy. Will not fall out.
- Completely comfortable—with little or no difficulty in speaking.
- No excessive bite opening. All teeth in register, which protects against dangerous "upper cut blows."

FOR COMPLETE INFORMATION and instruction manual call your dental dealer or write to:

WG *The William Getz Corporation*

7512 S. GREENWOOD AVENUE • CHICAGO 19, ILLINOIS



DOCTOR,
the real
lowdown
on the low
lower
lowest

New Weber
POWERCHAIR

1. Power-Driven Back

As convenient as power steering. With a touch of the foot, a lever places the patient where you want him smoothly, without effort.

2. Toe Board

Designed to appease apprehension – gently moves outward as pressure is directed against it. Eliminates that "trapped" feeling.

3. Controls

No matter where you operate, standing, sitting, front, back, right, left, all controls assure you minimum motion.

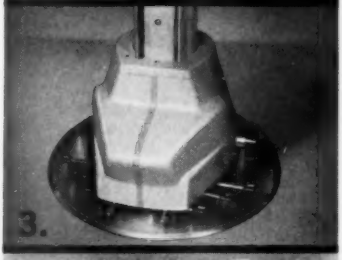
4. Contoured Arms

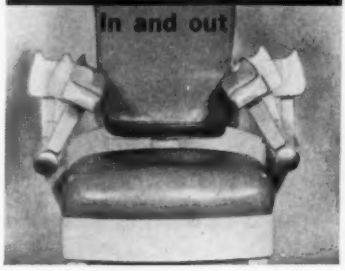
Up and down – arms automatically adjust to patient position.

In and out – Fingertip release permits arms to rotate in or out, or to a "drop" position, to fit narrow, broad, average or small patients.

Compare the low position of the new Weber Powerchair with other makes – See the difference. Weber has the lowest silhouette by far. The difference shows up in the actual measurements in each case from the floor to the chair seat. Check for yourself.

The WEBER DENTAL Manufacturing Company
Canton 5, Ohio





LUXENE VINYL DENTURES

SET THE STANDARD

Luxene **vinyl resin** was developed over 20 years ago exclusively for the dental profession; it has no other commercial uses. Superior from its inception, this material has been continually improved. Luxene reaches the public **only** through the dentist's office.

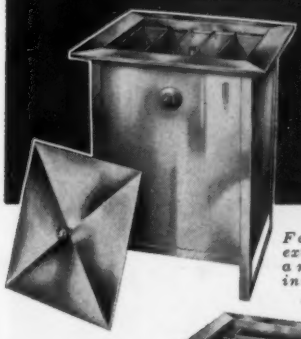
Luxene's extraordinary flexural and impact strength, and resistance to moisture absorption, assure long-lasting dentures that maintain original form and color. There is virtually no breakage with Luxene dentures (0.005%). The fracture rate of acrylic dentures is 12 times as great as for Luxene.*

*NOVEMBER 1960 JADA: "Clinical Observations of Number of Fractures of Acrylic and Modified Copolymer Vinyl Dentures"; William F. D. Grant, D.D.S., department of dentistry and oral surgery, Henry Ford Hospital.

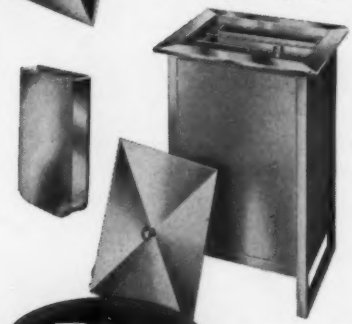
LUXENE

LUXENE INC.

NEW YORK



For 5 x 7 extra-oral and all intra-oral films



For 8 x 10 extra-oral and all intra-oral films

Rinn

RINN X-RAY DEVELOPING TANKS . . .
Compactness, versatility and simplicity of operation are a few of the distinguishing characteristics of the popular war machine known as the General Grant. Rinn X-Ray Developing Tanks are also famous for 'on-the-job' results . . . the last word in more accurate radiographic film processing. Easy to install and operate, there are only two simple plumbing connections. Corrosion proof stainless steel alloy is used throughout. Thoroughly insulated water jackets result in improved temperature control and more rapid thermal conductivity. Durable, easy-to-clean insert tanks have rounded bottoms—prevent stain and corrosion. Two sizes; for either 5 x 7 or 8 x 10 extra-oral films, as well as all intra-oral radiographs. Sensibly priced. For further information see your dealer or write Rinn Corporation, 2929 North Crawford Ave., Chicago 41, Ill. Catalog of the complete Rinn line is available upon request.

LEADERS IN THE DEVELOPMENT OF DENTAL X-RAY TECHNIQUES AND PRODUCTS

Oracaine* and HIGH SPEED are like this!

ORACAINE Hydrochloride, the modern anesthetic, is tailor made for the current high speed technics. If you use high speed, you will be particularly interested in these specific advantages of ORACAINE*

ORACAINE* anesthesia is:

1. ALMOST INSTANTANEOUS IN ONSET
2. SHORT IN DURATION—45-55 MINUTES
3. VERY DEEP
4. NOTABLE FOR RAPID DISAPPEARANCE OF SYMPTOMS (ABOUT 30 MINUTES AFTER OPERATING DEPTH LESSENS)
5. ASSOCIATED WITH A HIGH FACTOR OF SAFETY

P.S. Wonderful for your work with children too.

*ORACAINE Hydrochloride (brand of meprylcaine hydrochloride) with epinephrine 1:50,000

Oradent CHEMICAL CO., INC.

Division of MIZZY, INC., Clifton Forge, Va.

Accepted American Dental Association

Announcing a New Denture Cleanser to meet Advanced Professional Standards Its name–Bon Dent

The *Bon Dent* formula is a result of 28 months exacting research on problems suggested by Anderson & Lammie ". . . Prognosis in partial denture cases is bad if oral hygiene is poor . . . with a tissue born appliance [it] is particularly unfavorable. Here pronounced inflammation of mucosa and gingivae is always evident.[1]" Similarly, Thoma & Robinson report "filth under dentures may contribute to or be responsible for irritative changes.[2]"

Bon Dent, as an efficient brushing cleanser with alumino silicates – hexachlorophene base, proves remarkedly successful in reducing these potential irritative factors.

Baer & Klein's studies[3] of al-hex cleansed removable prostheses revealed bactericidality in a series of thioglycollate cultures.

Bon Dent is intended for your recommendation in accord with the highest professional standards.

Reprints available on request

1. Anderson & Lammie: *Clinical Survey of Partial Dentures*
2. Thoma and Robinson: *Oral and Dental Diagnosis*
3. Baer and Klein: *Bactericidal Effect in Removable Oral Prostheses Relating to Aluminosilicates-Hexachlorophene et. al.*

NATIONAL DRUG DIVISION

The Bon Ami Company

445 PARK AVE., NEW YORK 22, N. Y.

National Drug Division, The Bon Ami Co.
445 Park Ave., New York 22, N. Y. Dept. 4

Please send professional samples of Bon Dent denture cleanser to

Dr._____

Address_____

ANTIDOTE

℞

TRUBYTE® Bioblend® ANTERIORS

. . . to relieve monotonous and lifeless tooth color . . . use when indicated . . .
(*on your next denture patient*)

A Product of The Dentists' Supply Company of N. Y., York, Pa.

the Journal of the American Dental Association

Changes in dentures during storage in water and in service

Julian B. Woelfel, D.D.S.; George C. Paffenbarger,† D.D.S., and William T. Sweeney,‡ A.B., Washington, D. C.*

Changes occurring during two years in 73 clinical and 48 technic dentures, made of 12 types of denture bases, showed that: (1) except for slight shrinkages of hard rubber and a vinyl-acrylic copolymer, there was a posterior linear expansion of from 0.02 to 1.60 per cent; (2) clinical dentures were generally as dimensionally stable as technic dentures stored in water; (3) no significant warpages occurred; (4) none of the dimensional changes affected the fit of the dentures, and (5) three upper dentures fractured, one from a blow, the other two during chewing. Teeth came out of the high expanding dentures made of an epoxy resin.

Many dentists believe that the presently available resin denture base materials distort severely in clinical service. This idea persists although many published reports give data to the contrary.[1-8] Some dentists claim to prevent such failures by employing a cast metal base. Yet a metal base will not necessarily fit the cast better than an acrylic resin base. In fact, recent data indicate rather poor accuracy for some of the cast chromium-cobalt alloys.[9] Lytle[10,11] demonstrated that the oral tissues are distorted severely in a few days by ill-fitting dentures. These distortions change the contour of the mucosa to a far greater degree than does the slight inaccuracy in dimension that develops in processing or in using an acrylic or metal base.

This report shows the magnitude of dimensional changes that occur in clinical resin dentures and relates these values to the fit and serviceability of the dentures after about two years; also it correlates the dimensional changes of thin and thick technic dentures stored in water at a constant temperature with changes in clinical dentures made of the same materials. Such information will aid

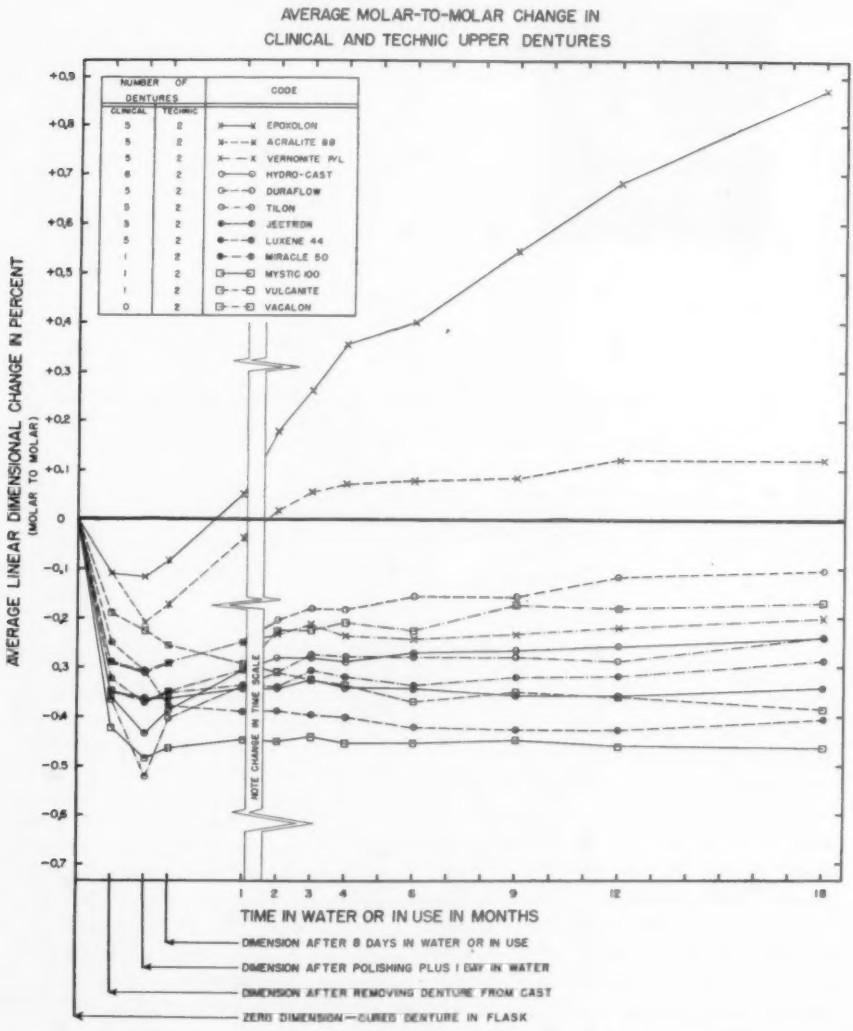


Fig. 1 • Average molar-to-molar change in clinical and technic upper dentures

in predicting dimensional changes in clinical dentures on the basis of laboratory tests on technic dentures.

METHODS AND MATERIALS

The data in this report are a continuation of the scheduled measurements on the same group of technic and clinical dentures for which the dimensional changes during processing were shown.[8] Representatives of twelve different types of organic denture bases and the number of technic and clinical dentures of each type on which measurements were made are shown in Figures 1 and 2.

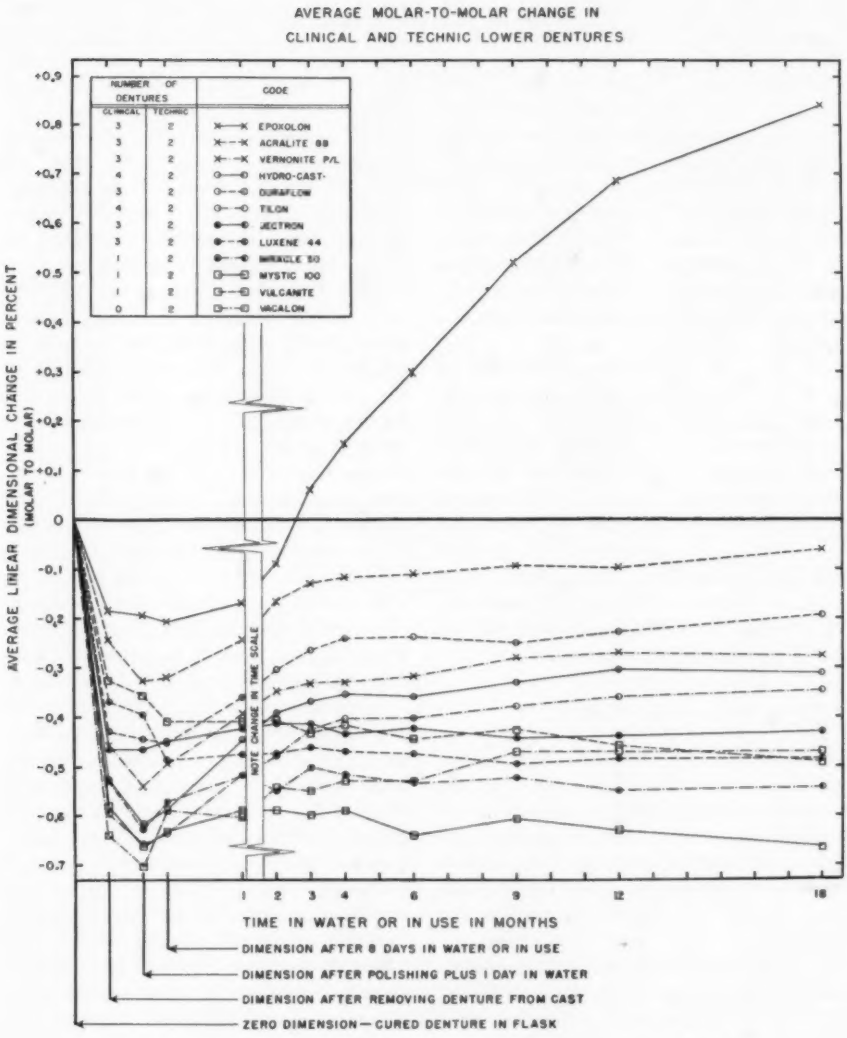


Fig. 2 • Average molar-to-molar change in clinical and technic lower dentures

The polished clinical dentures were mounted on a Hanau Model articulator using a new centric interocclusal record obtained in the mouth. Occlusal corrections in both centric occlusion and the eccentric positions were then made prior to giving the dentures to the patient. Twenty-four and 48 hour postinsertion appointments were scheduled for all patients and adjustments were made where necessary. These and any subsequent adjustments were recorded. Thus, all patients were observed closely during the first weeks. Three to eight months later

in 1958 and during the summers of 1959 and 1960, the fit and serviceability of each denture was evaluated by: (1) photographing pressure-indicator paste patterns; (2) checking occlusal relationships; (3) noting resistance to dislodgment when force was applied vertically with the dentist's thumb or index finger to the right and left first molars and to the central incisors; (4) checking the fit of the denture on the original gypsum cast when it could be saved in the deflasking and (5) obtaining the patient's opinion.

At the time of the first evaluation in 1958, photographs of the pressure-indicator paste patterns were also obtained on the patient's old dentures, which had been retained by the authors. The detailed findings of the clinical evaluation of the newer dentures made two and three years after insertion and possible correlations between the physical properties of the resin bases and the behavior of clinical and technic dentures will be given in subsequent reports.

CHANGES IN DIMENSIONS

Average Changes • The average molar-to-molar changes in dimension (during processing, on storage in water for 18 months or in use) of technic and clinical upper dentures made of 12 types of denture bases are shown in Figure 1. Similar data for the lower dentures are in Figure 2.

Without exception, the average molar-to-molar shrinkage of the upper dentures, from the cured denture in the flask through polishing and one day in water, was less than that of the lower dentures regardless of the composition of the base. The average linear shrinkage of the 68 upper dentures was 0.33 per cent; that of the 53 lower dentures, 0.50 per cent. Eighteen months later the average shrinkage of the upper dentures with the exception of Epoxolon was 0.22 per cent; that of the lower, 0.34 per cent. These results are consistent with previous reports.[6,7,12,13] The Epoxolon upper dentures expanded 0.87 per cent and the lower dentures expanded 0.84 per cent.

With one exception (Epoxolon), the most significant average dimensional change in the bases occurred when the dentures were removed from their gypsum casts, polished and stored in water for one day. The average shrinkage on all the bases ranged from 0.12 per cent (upper Epoxolon denture) to 0.70 per cent (lower Vacalon denture). Differences of this order were not detected by the dentist when placing the dentures in the mouth. Consequently, no superiority in the initial fit of the dentures constructed of the various bases was noted. Previous work on one patient indicated that considerably larger dimensional change in a denture was necessary before the change could be detected clinically.[14]

Most dentures expand on storage in water or in use because of the sorption of water by the resin base. This expansion generally compensates in part for the curing shrinkage (Fig. 1 and 2 and Table 1). The expansion of the 18-month-old Epoxolon dentures, however, was 6.7 times their curing shrinkage. This expansion had not stopped at the end of 24 months when this report was prepared. The dentures made of the vinyl-acrylic copolymer (Luxene 44) and of vulcanite shrank slightly (0.10 per cent and 0.15 per cent, respectively [Table 1]) over the 18 month period, whereas the other dentures expanded. Dentures of these two materials then would not be as accurate a reproduction of the wax dentures after 18 months in water or in use as they were immediately after processing and polishing. These observations are consistent with previous findings.[15,16] Conversely, dentures made from all the other materials, except Epoxolon, would be more accurate reproductions after 18 months than immediately after processing and polishing.

The relative accuracy of the various

Table 1 • Relation between average curing shrinkage and average molar-to-molar changes in upper and lower dentures stored in water or in use

Denture base	Number of dentures	Curing change* (%)	Change in water or in service in 18 months† (%)	Total changes‡ (%)	Temperature correction§ (%)	After temperature correction‖ (%)
Acralite 88	12	−0.26	+0.30	+0.04	+0.14	+0.18
Duraflow	12	−0.37	+0.23	−0.14	+0.13	−0.01
Epoxolon	12	−0.15	+1.01	+0.86	+0.11	+0.97
Hydro-Cast	14	−0.51	+0.25	−0.26	+0.13	−0.13
Jectron	12	−0.41	+0.03	−0.38	+0.10	−0.28
Luxene 44	12	−0.34	−0.10	−0.44	+0.10	−0.34
Miracle 50	6	−0.50	+0.08	−0.42	+0.07	−0.35
Mystic 100	6	−0.58	+0.02	−0.56	+0.06	−0.50
Tilon	13	−0.59	+0.30	−0.29	+0.12	−0.17
Vacalon	4	−0.54	+0.22	−0.32	+0.12¶	−0.20
Vernonite P/L	12	−0.40	+0.18	−0.22	+0.15	−0.07
Vulcanite (Hygienic dental rubber)	6	−0.29	−0.15	−0.44	+0.08	−0.36

*Molar-to-molar change from cured denture in flask through polishing and one day in water.

†The amount of gain (+) or loss (−) in molar-to-molar distance caused by storage in water (technic dentures) or in use (clinical dentures).

‡Molar-to-molar change from cured denture in flask through 18 months' storage in water or in use.

§Expansion of dentures when heated from room temperature (22°C. [72°F.]), the temperature at which the molar-to-molar distances were measured, to mouth temperature (37°C. [98.6°F.]), the temperature of the dentures when in use. The coefficients of thermal expansion used in computation of these values were obtained from an unpublished report by other staff members of the dental research section at the National Bureau of Standards.

‖The sum of (‡) and (§) represents the average change in molar-to-molar distance from the cured denture in the flask at room temperature to the denture in use 18 months later at mouth temperature.

¶The coefficient of thermal expansion used in this computation was 83×10^{-6}, an estimated coefficient based on other values for water saturated poly(methyl methacrylate) bases over the range (20°-37°C. [68°-98.6°F.]).

bases is given in the last column of Table 1. The ideal value would be zero. Theoretically, the more the deviation from this ideal, the less satisfactory would be the fit of the denture. However, small differences in dimensional accuracy among most of the bases are purely academic and require precise laboratory measurements to detect. Even the large differences among the bases (Fig. 1 and 2 and Table 1) could not be detected clinically. Most of the clinical dentures fitted well after 18 months. A few fitted poorly after this period. Some of those fitting well were made of each of the materials tested and the poorly fitting dentures were distributed in the range of dimensional changes shown. No pattern or trend in superiority of clinical fit was noted for any material or processing technic at the time of insertion nor 18 months later.

Individual Denture Changes • In 1950-1952, a series of clinical dentures of self-curing and heat-curing acrylic resins were made at the National Bureau of Standards and at several hospitals of the Veterans Administration. The dimensional changes of these dentures during the first two years of clinical service were published.[4] Remeasurements were made of the available dentures that had suitable reference lines after more than six years. The average flange-to-flange changes during the six years were − 0.29 per cent for six self-cured upper dentures; − 0.08 per cent for four heat-cured upper dentures; + 0.30 per cent for two self-cured lower dentures and + 0.25 per cent for four heat-cured lower dentures.[5] The flange-to-flange changes on the upper dentures, both self-cured and heat-cured, for six years more or less, are shown in Figure 3; those for lower dentures, in Figure 4. The initial measurements were obtained when the dentures were delivered to the patients.

Gross generalizations must be made as

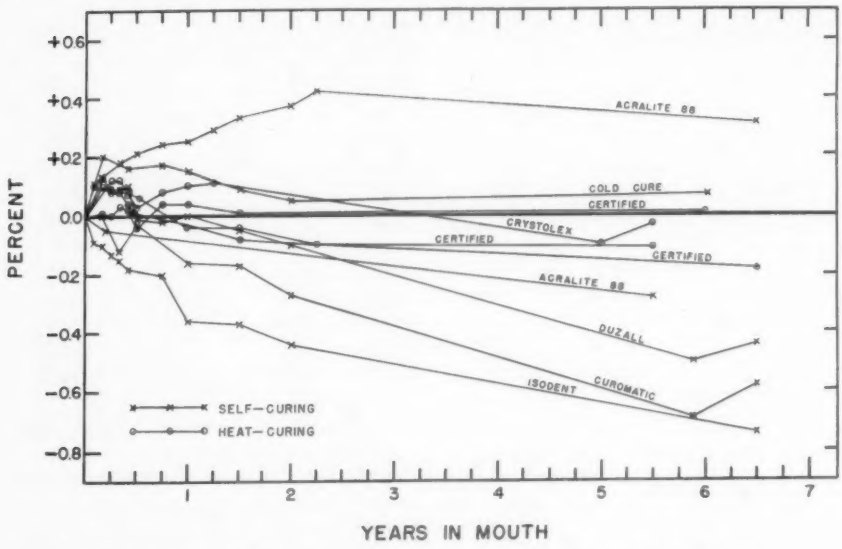


Fig. 3 • Flange-to-flange changes in self-curing and heat-curing upper dentures

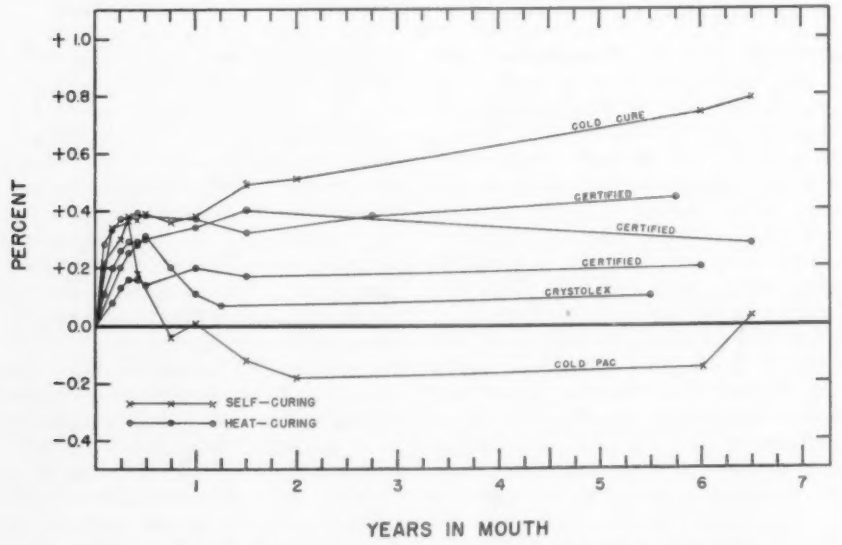


Fig. 4 • Flange-to-flange changes in self-curing and heat-curing lower dentures

there were only 16 dentures on which the six-year measurements could be taken. The upper dentures usually shrank slightly and the lower dentures expanded slightly. The largest linear changes amounted to slightly less than 0.08 per cent or about 0.5 mm. over the six years. The largest changes after the first year were about 40 microns yearly on the average. These did not adversely affect the fit or serviceability of the dentures and could not be detected clinically by the patient or the dentist.

On nine of the 16 six year old dentures the reference lines were suitable for molar-to-molar measurements. In seven of these nine dentures the difference between the molar-to-molar and the flange-to-flange changes was 0.2 mm. or less; in the two self-cured lower dentures the difference was about 0.4 mm. So there was no significant warping or distortion of either the self-cured or heat-cured dentures.

The self-cured dentures generally changed slightly more than the heat-cured dentures. This may reflect the greater stiffness and strength of the heat-cured denture base resins.[17] The slight differences, however, have no practical significance.

Comparison of Changes in Technic and Clinical Dentures • As previously shown,[8] the average molar-to-molar change on processing, polishing and storage in water for one day of the 71 clinical dentures was generally between the average change for the thin and the average change for the thick technic dentures made of the same materials. Shortly after this, the clinical dentures were inserted while the technic dentures remained stored in water at 23 ± 1°C. (73.4 ± 2°F.). Subsequent dimensional changes that occurred in some upper dentures are shown in Figure 5. Lower dentures had a similar pattern. The same general pattern of shrinkage

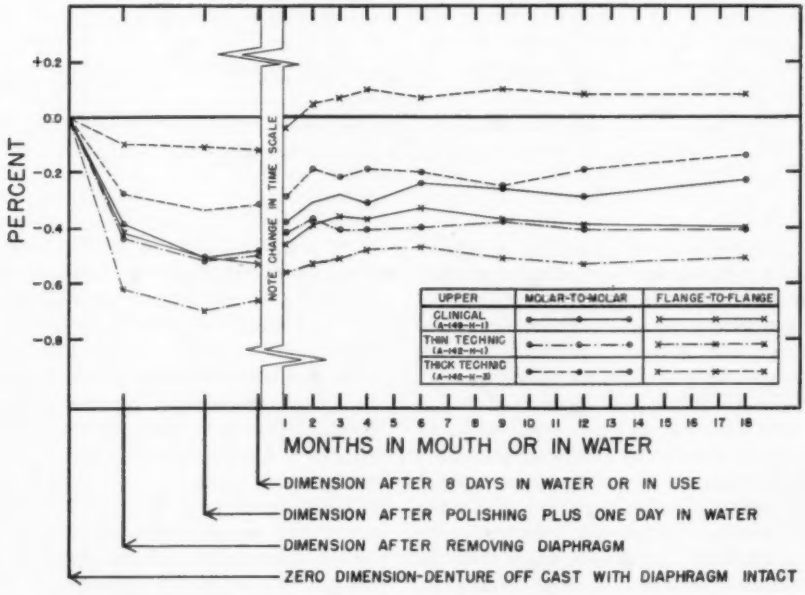


Fig. 5 • Comparison of linear change in technic and clinical dentures (Hydro-Cast)

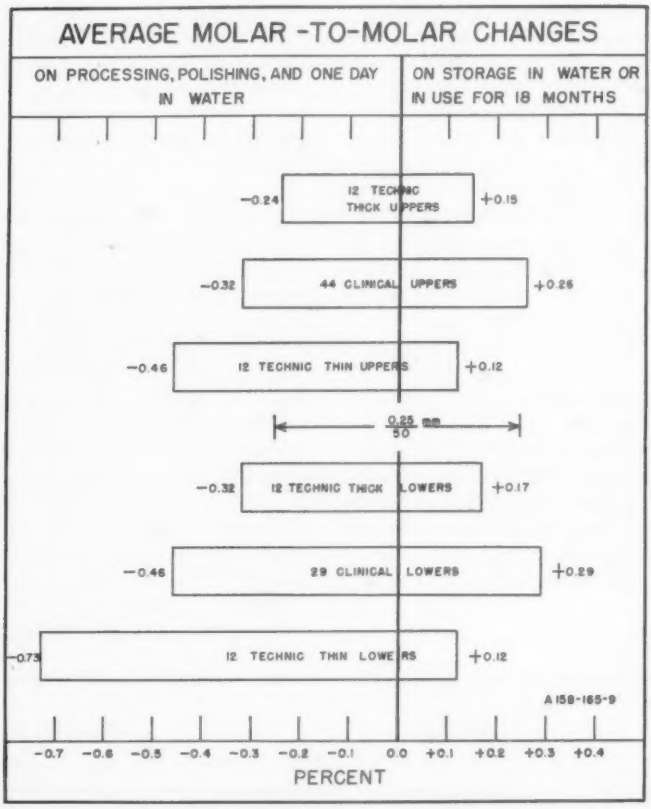


Fig. 6 • Relation of bulk and shape of dentures to average linear changes during processing, during storage in water and in service

on removal from the cast and on polishing is followed by a gradual expansion during the first three or four months at which time relative dimensional equilibrium usually is reached for both the technic and clinical dentures (Fig. 5).

The molar-to-molar changes in the individual clinical dentures were within the range of ± 0.15 mm. of those in the thin and thick technic dentures of corresponding bases, with the exception of the five upper clinical Epoxolon dentures which expanded 0.2 to 0.5 mm. more than the technic Epoxolon dentures. Usually the forces to which the denture was subjected in use did not cause appreciable permanent dimensional change. Apparently, practically all the change in dimension after polishing was caused by sorption of water.

Some small differences in dimensional changes of clinical dentures in use and of technic dentures in water for 18 months are shown on the right in Figure 6. The average percentage expansions in use or in water, shown on the right, compensate in part for the processing shrinkages on the left. The average molar-to-molar expansion of the clinical dentures in use was greater than for either the thin or

Table 2 • Warpage index at the end of 18 months*

Base material	Technic dentures					Clinical dentures									
	Upper		Lower			Upper						Lower			
	Thin (%)	Thick (%)	Thin (%)	Thick (%)	Av. (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Av. (%)	1 (%)	2 (%)	3 (%)	Av. (%)
Acralite 88	0.00	0.05	0.05	0.04	0.04	0.05	0.06	0.37	0.04	0.59	0.22	0.09	0.05	0.09	0.08
Duraflow	.08	.02	.04	.02	.04	.13†	.04‡	.15	.03	.22	.12	.00	.13	.07	.07
Epoxolon	.03	.06	.30	.04	.11	.13	.19	.28	.18	.51	.26	.22	.61	.07	.30
Hydro-Cast	.08	.05	.06	.03	.05	.01	.11	.11	.12	.04	.08	.03	.06	.15	.08
Jectron	.11	.12	.07	.13	.11	.06	.00	.03	.06	.14	.06	.00	.07	.00	.02
Luxene 44	.03	.01	.06	.01	.03	.02	.01	.11	.01	.05	.04	.09	.01	.12	.07
Miracle 50	.04	.01	.04	.06	.04	.05					.05	.02			.02
Mystic 100	.10	.17	.10	.00	.09	.06					.06	.21			.21
Tilon	.12	.19	.13	.22	.16	.23	.11	.27	.01	.29	.18	.06	.04	.15	.08
Vacalon	.07‡	.09	.02‡	.13	.08										
Vernonite P/L	.06	.02	.01	.07	.04	.19	.18	.04	.01	.19	.12	.05	.11	.11	.09
Vulcanite	.04‡	.12	.14‡	.08	.09	.37					.37	.19			.19
Average	% (0.07)		% (0.08)			% (0.14)						% (0.10)			

*Difference in percentage change between the molar-to-molar and flange-to-flange measurements.
†Nine month value.
‡Twelve month value.

thick technic dentures in water. The average differences are small, running from 0.11 to 0.17 per cent. It may be that the slightly greater expansion of the clinical dentures was caused by their flexure in saliva at 37°C. (98.6°F.), as the technic dentures were at rest in water at 23°C. (73.4°F.).

The thick technic dentures expanded slightly more during 18 months of storage in water than did the thin technic dentures (Fig. 6). This higher expansion coupled with a low processing shrinkage indicates that the thick technic dentures are consistently more stable in dimension than the thin technic dentures.

Warpage Index • Warpage index in this report is defined as the difference in percentage change between the molar-to-molar and the flange-to-flange distances. The fiducial reading was taken immediately after immersing the denture in water for one-half hour just subsequent to cast removal; the final reading was taken at 18 months in water or in service. For example, if a denture expanded or shrank proportionally over the molar-to-molar and the flange-to-flange distances, its warpage index would be zero. However, if it expanded molar-to-molar and shrank flange-to-flange, or if the shrinkage or expansion over the two distances was greatly out of proportion, the warpage index would be relatively high.

The warpage index for 48 technic and 70 clinical dentures is given in Table 2 with a range from 0.00 per cent for six dentures to 0.61 per cent for one lower clinical denture of Epoxolon, which expanded 0.99 per cent molar-to-molar and 1.60 per cent flange-to-flange. Even this warped denture continued to fit and function in a satisfactory manner and the patient was unaware of any change. The data in Table 2 show that most of the clinical dentures had slightly larger warpage indices than the technic dentures made of the same material. The widest variations in warpage index between the highest value for technic and clinical dentures of a particular base material were noted for Acralite 88 and pink vulcanite, which have lower stiffness and transverse strength than the others, and for the Epoxolon dentures which have a

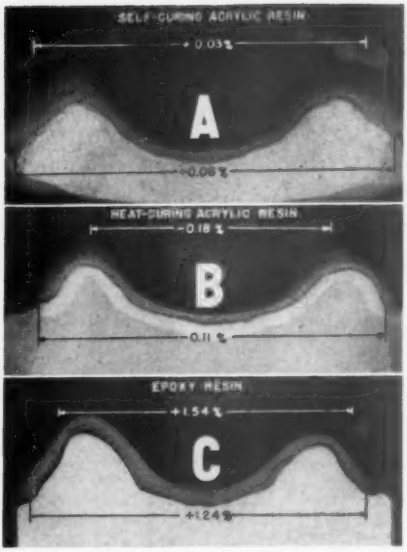


Fig. 7 • Relation between fit of upper clinical dentures on gypsum cast on which they were cured and changes in molar-to-molar and flange-to-flange distances

All end measurements were obtained after 24 months in service. Fiducial measurements were made with deflasked dentures on cast except in flange-to-flange measurement on denture A. Here, fiducial measurement was made on denture removed from cast

large expansion. Even these differences were small. The warpage index comparisons (Table 2) do not indicate any significant superiority in the dimensional stability of the dentures made from any of the 12 base materials tested. The average warpage index for the 48 technic dentures was 0.07 per cent and for 70 clinical dentures it was 0.12 per cent. These differences are far too small to have any significance practically. Here again the technic dentures predicted the approximate behavior of the clinical dentures.

Relation Between Fit of Clinical Dentures on the Gypsum Casts on Which They Were Cured and Changes in Molar-to-molar and Flange-to-flange Distances • Figure 7 shows clinical upper dentures 24 months old seated on the gypsum casts on which they were cured. Denture A, made of a self-curing acrylic resin, had very low molar-to-molar (0.03 per cent) and flange-to-flange (0.06 per cent) expansion. Consequently, denture A fits the cast remarkably well. Denture B, made of a heat-curing acrylic resin, had low molar-to-molar (0.18 per cent) and flange-to-flange (0.11 per cent) shrinkages. The degree of fit is only slightly less than in denture A. In denture C, made of an epoxy resin, the gross expansions (molar-to-molar, 1.54 per cent, and flange-to-flange, 1.24 per cent) are reflected in the poor fit of the denture on its cast.

Some of the minute discrepancies in fit shown in dentures A and B (Fig. 7) occurred during processing and polishing before the patients had the dentures. In contrast, practically all the dimensional changes occurring in denture C came while the denture was in use. Denture C continued to fit the mouth well because the very large expansion occurred slowly, thus the tissues were able to adapt. The refitting of a denture on its original gypsum cast shows whether some dimensional change or warpage occurred.

The examples of the fit of upper dentures (Fig. 7) are typical of the 14 upper dentures for whom the casts on which they were processed could be recovered. The original casts of nine clinical lower dentures, which had dimensional discrepancies similar to those of the upper dentures, were recovered. These lower dentures usually fitted their casts better than the upper dentures after 24 months of service.

The correlation between dimensional changes in upper dentures and their relative fit on the cast on which they were processed confirms previous work of the authors.[6, 14]

If the fit of a denture on the cast on which it was processed is not as accurate as that shown by denture B (Fig. 7), the operator should look for errors in technic or faults in the resin base.

Pressure-indicator Paste Patterns • As stated previously, all patients were recalled in 1958, after the dentures had given several months of comfortable service. The new dentures and the old dentures, which the patients had worn previously and which the authors had retained, were wiped dry and coated with a thin layer of a pressure-indicator paste (Mizzy Pressure Indicator Paste). They were then sprayed with an emulsion furnished with the paste, inserted under heavy manual pressure, removed and photographed. In all instances, the new dentures showed a more uniform contact with the oral tissues than the old dentures. Typical patterns of the variation in contact with the tissues are shown in Figure 8. There was no relation between the type of resin or method of processing and the patterns. There was a definite correlation between the fit of the new and the old dentures and the pressure-indicator-paste patterns of the new and old dentures. In some instances this test revealed discrepancies in the fit of the new dentures that neither the patient nor the dentist had been aware of. Adjustments on these dentures were made by removing a thin film of resin from the area or areas of heavy contact. Such a recall system might be advisable periodically of all patients who wear dentures.

Breakage • Out of 73 clinical dentures, three were broken. Figure 9,A, shows a crack in a Jectron upper denture that was opposed by lower natural teeth. The crack developed in use after 15 months. Denture B in Figure 9 also was opposed by natural teeth. According to the patient, the distobuccal flange was broken off of this denture, made of Vernonite (powder-liquid type), when the patient bit on a piece of hard caramel candy that was lodged between the natural lower third molar and the buccal flange of the upper denture. This denture was 23 months old when the break happened. Another upper denture of Vernonite, also opposed by natural teeth, was fractured when the patient was struck in the mouth.

Out of the 44 upper clinical dentures, 14 were opposed by natural teeth.

Loss of Teeth • No teeth came out of any of the dentures except those made of Epoxolon. After only 15 months, the eight clinical dentures of Epoxolon had lost 31 porcelain posterior teeth. The posterior teeth came out of the dentures because a crevice developed around them (A in Figure 10). The crevices also occurred around the anterior teeth (B in Figure 10) but none were lost during the first 15 months, probably because of the additional retention furnished by the metal pins in the anterior teeth. The crevices developed as the dentures swelled in contact with the saliva. Naturally, the crevices coupled with the porosity (A and B in Fig. 10) made the dentures very unhygienic.

Staining, Color Instability, and Roughness of Surface • Clinical dentures of Epoxolon showed a marked tendency to collect stains quickly, such as lipstick and, particularly, tobacco stains. The patients complained that these dentures were more difficult to keep clean than their previous dentures. The tendency of Epoxolon dentures to stain rapidly and easily is vividly shown in Figure 11. Here A is a heat-curing acrylic resin denture that the patient had worn for eight years with no other treatment than cleaning at home. Denture B is an Epoxolon denture after one week's use by the same patient who formerly wore acrylic resin denture A.

The clinical dentures made with a Jectron (polystyrene) base showed a slightly greater tendency to collect tobacco stain than those made of poly(methyl methacrylate), but this was not severe enough to be a deterrent to the use of the polystyrene. Dentures made with a poly(methyl methacrylate) base usually collected stain only in areas where the

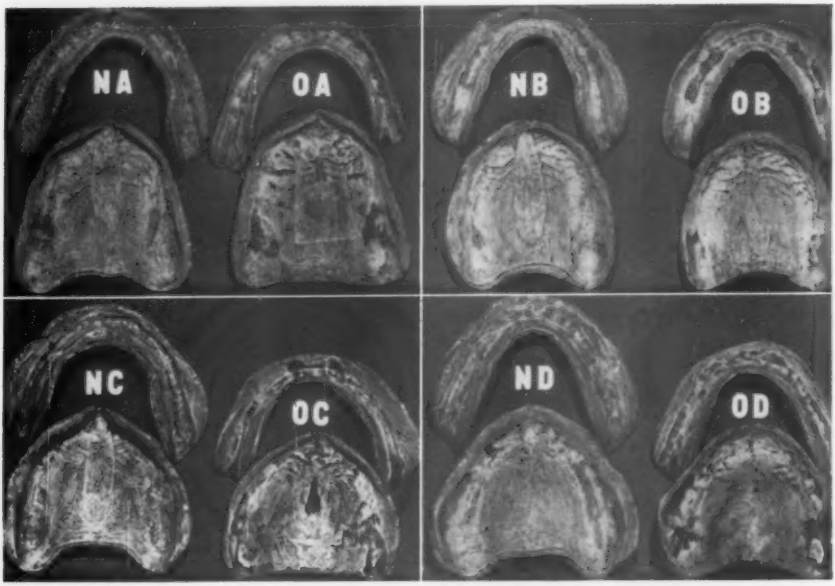


Fig. 8 • Pressure-indicator-paste patterns of new (NA, NB, NC and ND) and old (OA, OB, OC and OD) dentures. New dentures were compression-molded acrylic resin (NA); an epoxy type of resin (NB); an injection-molded acrylic resin (NC), or a polystyrene (ND). All old dentures seemed to be acrylic resin except upper OD, which was vulcanite. Dark areas indicate heavy contact

Old upper dentures, with few exceptions, show bilateral heavy contact on posterior part of ridge, especially crest of ridge near tuberosity. In old lower dentures, areas of heavy contact usually were bilateral and occurred mostly on crest of ridge

Some areas of heavy contact also were present on new dentures

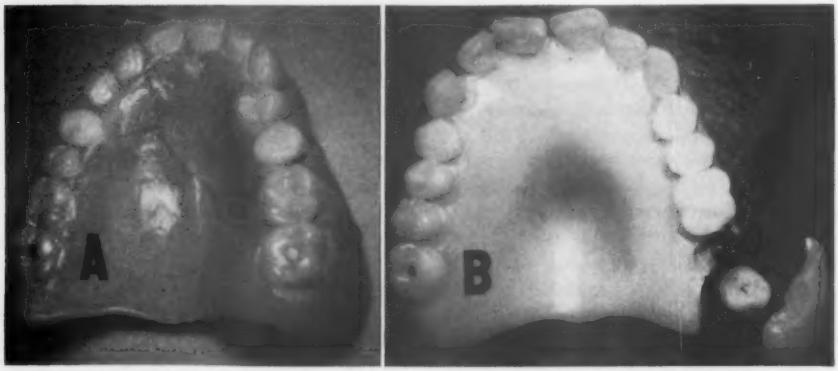


Fig. 9 • Shown in A is typical midline fracture in Jectron upper denture opposed by natural teeth. Crack extending through labial flange developed after 15 months of use. In B is fracture that occurred in Vernonite (powder-liquid type) upper denture opposed by natural teeth

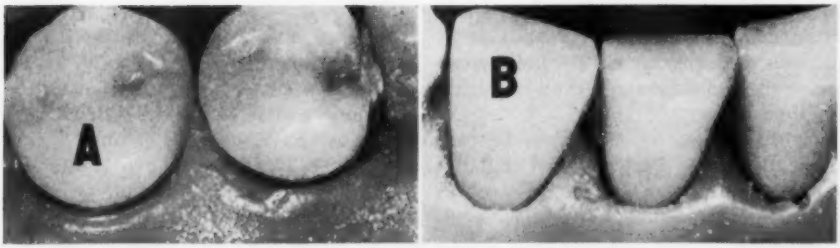


Fig. 10 • Epoxolon dentures showing separation of teeth from base resin. Upper denture A and lower denture B were in service 17 months when two left upper molar teeth were lost. No molding pressure was used in packing or curing, so porosity evident in (A) and (B) frequently occurred in areas of thick cross section

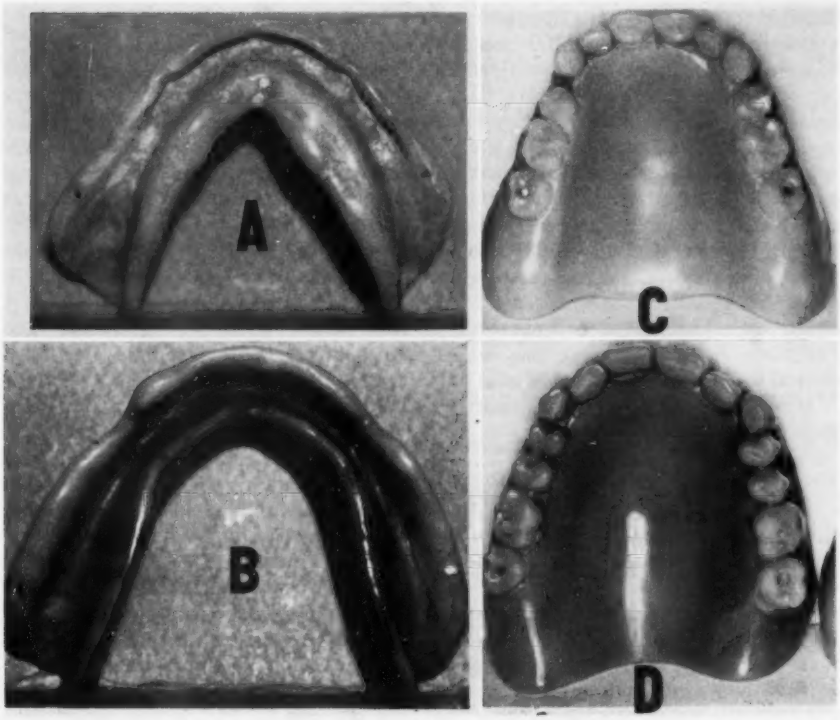


Fig. 11 • Denture A, of heat-curing acrylic resin, worn by patient eight years. Only slight staining and calculus deposits are present. Denture B, made of Epoxolon for same patient, shows staining that occurred in one week's use. Denture C, of heat-cured acrylic resin, had been in service 28 months and was not repolished. Denture D, of Epoxolon, was repolished after 29 months of service. Color of Epoxolon denture (D) at time it was given to patient was about the same as that of heat-cured acrylic resin denture (C) used in this comparison

surface had not been polished properly or in conjunction with a deposition of calculus, whereas those of the polystyrene base collected some stain, even on highly polished areas.

Epoxolon was the only denture base resin among the 12 types used that did not comply with the color stability test of the American Dental Association Specification No. 12 for Denture Base Resin. Dentures of this material shifted from tissue pink to an orange tint both in the lamp test for color stability described in the Specification and in actual use. The clinical dentures of Epoxolon were the only ones that were not color stable in use (D in Figure 11). This presents another example of the unusual validity of the color stability test in the Specification.

Dentures made of Mystic 100, an acrylic resin denture base which contained 21 per cent by weight of glass fibers, had a rough surface on molding. The tissue side could not be polished, and its roughness appeared to irritate the tissues to such an extent in 15 months that new dentures with a different base were made for the patient. The tongue side could not be polished to a smooth surface as the glass fibers shelled out of the surface and left rough depressions that collected stain. For these reasons only the one set of clinical dentures was made of Mystic 100.

Most of the stain on all the dentures appeared to be tobacco tar.

SUMMARY

Changes in 73 clinical dentures and in 48 technic dentures stored in water were observed periodically for 18 months by: (1) measuring molar-to-molar and flange-to-flange changes across the posterior section, (2) taking pressure-indicator paste patterns of the tissue-borne surfaces, (3) checking the fit of the denture on the cast and in the mouth, and (4) observing breakage, loss of teeth, staining and color stability.

These dentures were made with eight different acrylic resins, a polystyrene, a vinyl-acrylic copolymer, an epoxy resin and vulcanite.[8]

All the dentures expanded during the 18 months in service or in water except the vinyl-acrylic copolymer and vulcanite, which shrank on the average 0.10 and 0.15 per cent over the molar-to-molar dimension. The average expansion of the other materials ranged from 0.02 per cent for a glass-fiber-filled acrylic resin to 1.01 per cent for an epoxy resin. After applying a temperature correction for mouth condition, the average molar-to-molar dimension at the end of 18 months ranged from 0.50 per cent smaller (glass-fiber-filled acrylic resin) to 0.97 per cent larger (epoxy resin) than the average molar-to-molar dimension of the cured denture in the flask (Table 1). Two heat-cured compression-molded acrylic resins were less than 0.10 per cent smaller and approached the ideal of zero per cent change. Regardless of these changes, neither the dentist nor the patient could observe any difference in the relative fit of the dentures.

Reference to Figures 1 and 2 shows that after two or three months in use or in water all the bases except the epoxy resin were stable in dimension and changed very little with time; that there appeared to be no advantage among the various bases tested in regard to dimensional change with the exception of the high expansion of the epoxy resin; that vulcanite had no advantage as far as dimensional stability was concerned, and that the expansion caused by water sorption did not compensate for the shrinkage during processing, except in the epoxy resin which expanded far too much and for the self-curing acrylic resin which slightly overcompensated.

Sixteen other dentures made of heat-cured and self-cured acrylic resins[4] were available to the authors for measurement after six years in use. The largest flange-to-flange changes in any of these dentures were not more than 0.5 mm. or about

0.08 mm. annually. None of the changes caused any adverse effects on the fit and serviceability of these dentures.

A comparison of the dimensional stability of technic dentures stored in water with clinical dentures made of the same materials showed only little differences that would not have any clinical significance.

The warpage index (the difference in percentage change between molar-to-molar and flange-to-flange measurements) was greatest for the epoxy resin, 0.30 per cent, and lowest for the polystyrene and glass-fiber-filled acrylic resin, 0.02 per cent. None of the warpage could be detected clinically.

The dimensional changes across the posterior portions of the dentures were reflected in the fit of the dentures on the gypsum casts on which they were processed. If there are serious misfits, the operator should look for errors in processing or for a faulty resin base.

Pressure-indicator-paste patterns of new dentures after several months of use demonstrated a more uniform contact with the oral tissues than the patterns made in the old dentures that the patient had worn previously. The patterns revealed discrepancies in the fit of new dentures that would not have been detected otherwise.

Three out of 73 clinical dentures broke. All were upper dentures opposed by natural teeth. One fracture of an acrylic resin denture was caused by a blow. In another acrylic resin denture the buccal flange was broken off in chewing. There was a typical midline fracture in one polystyrene denture.

The epoxy resin dentures stained badly and quickly lost teeth, were difficult to keep clean because of porosity and crevices that developed around the teeth, and were not color stable. These defects, combined with the high rate of expansion that had not leveled off after two years of service, show that this epoxy resin is not satisfactory as a denture base material.

All clinical dentures functioned well except those made of an epoxy resin and a heavily glass-fiber-filled acrylic resin.

This investigation was supported in part by research grant D-605, Evaluation of Resin Denture Base Materials, to the American Dental Association from the National Institute of Dental Research and by the United States Naval Dental School, who assigned Mr. John C. Carlson, a dental laboratory technician, to assist in this investigation. This report is part of the dental research program conducted at the National Bureau of Standards in cooperation with the American Dental Association, the Army Dental Corps, the Dental Sciences Division of the School of Aviation Medicine USAF, the Naval Dental Corps, and the Veterans Administration.

*Research associate, American Dental Association, National Bureau of Standards, on leave from the faculty of the College of Dentistry, Ohio State University, Columbus, Ohio.

†Senior research associate, American Dental Association, National Bureau of Standards.

‡Chief, dental research section, National Bureau of Standards.

1. Sweeney, W. T.; Paffenbarger, G. C., and Beall, J. R. Acrylic resin for dentures. J.A.D.A. 29:7 Jan. 1942.

2. Dolder, E. Physikalische Werkstoffprüfungen an Zahnprothesen im Laboratorium und am Patienten: Bedeutung, Methoden, Ergebnisse. Schweiz. Mschr. Zahnhk. 53:435 May; 535 June 1943.

3. Grunewald, A. H.; Paffenbarger, G. C., and Dickson, G. Effect of molding processes on some properties of denture resins. J.A.D.A. 44:269 March 1952.

4. Mowery, W. E., and others. Dimensional stability of denture base resins. J.A.D.A. 57:345 Sept. 1958.

5. Sweeney, W. T. Acrylic resins in prosthetic dentistry. D. Clin. N. America Nov. 1958, p. 593.

6. Woelfel, J. B., and Paffenbarger, G. C. Dimensional changes occurring in artificial dentures. Internat. D. J. 9:451 Dec. 1959.

7. Mirza, F. D. Dimensional stability of denture-base resins. I. Clinical evaluation. (Abst.) J. D. Res. 39:756 July-Aug. 1960.

8. Woelfel, J. B.; Paffenbarger, G. C., and Sweeney, W. T. Dimensional changes occurring in dentures during processing. J.A.D.A. 61:413 Oct. 1960.

9. Mills, Marion, and Wheatley, R. E. Accuracy of metal castings in complete and partial denture prosthodontics. To be published in J. Pros. Den.

10. Lytle, R. B. Management of abused oral tissues in complete denture construction. J. Pros. Den. 7:27 Jan. 1957.

11. Lytle, R. B. Complete denture construction based on a study of the deformation of the underlying soft tissues. J. Pros. Den. 9:539 July-Aug. 1959.

12. Vieira, Dioracy, F. Influência de materiais e técnicas sôbre a posição relativa dos dentes, na construção de uma base de dentadura. Tese. Faculdade de Farmácia e Odontologia da Universidade de São Paulo, 1958.

13. Peyton, F. A., and others. Restorative dental materials. St. Louis, C. V. Mosby Co., 1960, p. 412.

14. Woelfel, J. B., and Paffenbarger, G. C. Method of evaluating the clinical effect of warping a denture. J.A.D.A. 59:250 Aug. 1959.

15. Souder, Wilmer, and Paffenbarger, G. C. Physical properties of dental materials. National Bureau of Standards Circular C433. Washington, D. C., U. S. Government Printing Office, 1942.

16. Do vinyl-acrylic dentures fit better? Vernonite Work Bench, vol. 6, Aug. 1947.

17. Stanford, J. W.; Burns, C. L., and Paffenbarger, G. C. Self-curing resins for repairing dentures: some physical properties. J.A.D.A. 51:307 Sept. 1955.

The intramucosal insert: review and progress report

A. Norman Cranin, D.D.S., and Samuel L. Cranin,† D.D.S., Brooklyn*

Improvements have been made in the design and insertion of intramucosal inserts. The surgical indicator stylus, the head of the intramucosal insert and the shank of the base-preparing bur have been modified. Transfer paste has replaced the indelible pencil for transferring markings of receptor sites to the tissue-borne surface of the denture. The intramucosal inserts also have been found useful as an aid in removing claspless partial dentures, as an intermaxillary elastic hook in orthodontics or fracture reduction, and as an aid in the construction of free-end saddle partial dentures.

One of the more recent improvements in dental prosthetic practice employs the use of the intramucosal insert.[1,2] The technics of utilizing these tiny snap fastener-like retentive devices was described recently,[3] and the interest stimulated by this work prompted further study of the subject. This paper will explore the following phases:

1. Instrument design, use and effectiveness.
2. Surgical technic—ease of operation.
3. Universality of the procedure.
4. Tissue response.
5. Additional uses for intramucosal inserts.

Many queries were posed after the introduction of the original technic. Some of these questions were unanswerable until more dentures were completed, further studies made, and instrument design and surgical and prosthetic technic reviewed.

The basic procedure as previously described[3] can be summarized as follows: Small, elliptically shaped intramucosal inserts are processed into the tissue-borne surface of a complete maxillary denture which lacks retention (Fig. 1, left). These 2.5 mm. diameter nonreactive appliances (Fig. 1, right) are designed to be inserted into surgically prepared sites in the mucoperiosteum. After healing (ten days), it is found that the tissues have epithelized around the heads, supplying a surgically induced, undercut cul-de-sac which offers a site of retention about each of the 10 to 16 inserts that have been processed into the denture.

The ridge is anesthetized. Tissue thickness is explored with a sharpened millimeter probe, and the optimal locations are marked with an indelible pencil. The denture, which should be well stabilized and balanced occlusally, is seated and the marks transferred. Receptacles are cut with a bur at each pencil mark into the tissue-borne surface, and into these prepared holes, points (surgical indicator styluses), 2.2 mm. long, are seated. The denture is placed into position, and the

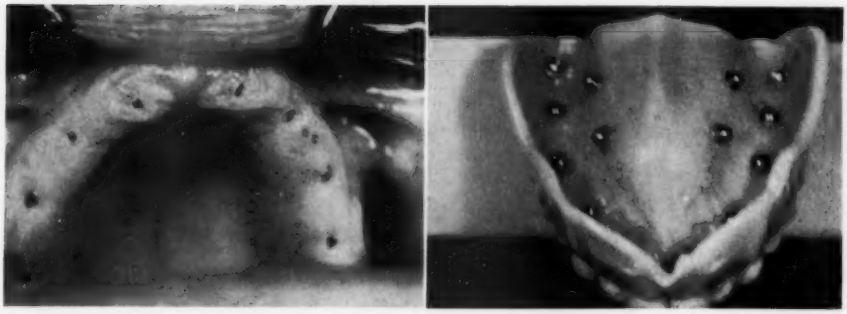


Fig. 1 • Left: Well-healed maxilla 24 weeks postoperatively. Right: Maxillary denture with completed intramucosal inserts

pointed styluses puncture the tissues, marking them. At each of these marks, a trephine is used to cut properly sized receptor sites into the mucoperiosteum. An intramucosal insert is processed into each receptacle in the denture base with self-curing resin, and the denture is seated. Each insert head slips into an opposing trephined receptor site. After healing, the denture may be removed for daily hygiene, and as long as it is worn with regularity, normal oral function is maintained. Retention is improved materially by the grasp of the healed cicatricial tissue about the necks of the inserts.

Since the initiation and utilization of this technic, several innovations have been introduced.

INSTRUMENT DESIGN

Surgical Indicator Stylus • The original instrument consisted of a simple round base 4.0 mm. in diameter and 1.3 mm. high. A 2.2 mm. high, pointed post extended perpendicularly from the center of the base. The purpose of this instrument was to mark the tissues by puncture for subsequent trephining. However, the slimness of the marker (or point) permitted it to slide out of the tissues instead of remaining in place as it was designed to do. The elasticity of the mucosa caused the puncture to close, often without even a mark. To facilitate a more accurate

Fig. 2 • Old and newly designed surgical indicator stylus

technic, the surgical indicator stylus has been redesigned with the cooperation of the Denserts Company (Fig. 2). Its base now has slightly rounded corners to discourage its binding in the denture base when the denture is removed. The major change, however, is in the marker. It has been made in an arrowhead shape so that it will slip into the tissues easily, but when the prosthesis is removed, it will remain embedded in the mucoperiosteum, clearly marking each receptor site. Whereas, with the old design, only 35 to 40 per cent of the styluses remained *in situ*, now all of them do with consistent success.

Intramucosal Inserts • The original intramucosal insert was shaped satisfactorily to induce epithelization about its head. The head was elliptical in cross-section outline with a relatively flat upper surface. This shape was chosen because it was considered that shallow tissues

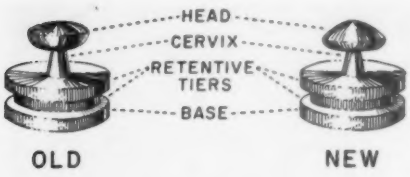


Fig. 3 • Newly designed intramucosal insert head compared with former one

would accommodate the flat head more readily. However, the flat head offered resistance while the denture was being seated. The sloping undersurface, on the other hand, made removal of the denture too easy (Fig. 3). The head of the intramucosal insert has been redesigned to facilitate insertion of the prosthesis, and to add retention once it is in position. The shape which affords these improvements is almost the opposite of the old one. The head has a pointed superior surface, which slopes down at rather acute angles to meet with the relatively flat underside. While overcoming the former difficulties, the new insert is the same over-all height as its predecessor. Another advantage of the pointed head is evident in shallow tissue regions where cortical bone must be trephined. Much less bone need be removed to permit entry of the point than was formerly required to permit placement of the broad, flat head.

Base-Preparing Bur • The shank of the bur has been lengthened for truer cutting and for more universal application in different handpieces.

SURGICAL TECHNIC

Transferral of Marks from Tissue to Denture • After the tissue has been explored, the proper sites are marked. Previously, indelible pencil was used for marking, but such markings do not transfer well. A new chemical formula termed a transfer paste has been used with good results in this exacting step. The paste consists of essential oils (eucalyptus, clove, menthol) and a mucilaginous zinc oxide paste (Fig. 4). The denture and tissues are dried, and then a minute quantity of the white paste is applied to the mucosal surface with the tip of an explorer. Transfer is predictably accurate. The paste is useful for correcting routine sore spots and is valuable as a pharmacological adjunct, in that the oils sterilize the tissue and serve as a counterirritant.[4]

Placement of Inserts • The choice of receptor site placement is the most important phase of the procedure. The optimal number for the average size maxillary denture is 14. Ten should be placed evenly along the crest of the ridge, and two should be placed on either side of the palatal vault, 1 cm. from the crest (Fig. 5, left). The various foramens and low-dipping antrums must be avoided, and 1 cm. of space should surround each insert to avoid ischemia and poor wound healing. If a tuberosity exists, the receptor site for the most distal insert should be placed in its posterior incline. A lack of parallelism in placement of the inserts is ideal (Fig. 5, right). Varying head angulations supply additional sources of retention between heads.

Processing the Insert into the Denture • According to the original technic, it was suggested that the base of the insert be processed carefully with self-curing resin and carried into the prepared receptacle in the tissue-borne surface of the denture by means of a small paintbrush. This procedure has been found difficult, since the base cutting bur cuts a hole just sufficient to accommodate the insert base. Hence, the slightest quantity of resin which seeps into the floor of the receptacle might cause the insert to be seated incorrectly. Since the exact placement of each insert is a critical operation, it has been found expeditious to cut sluiceways adjoining and at right angles to each receptacle. These permit the escape of

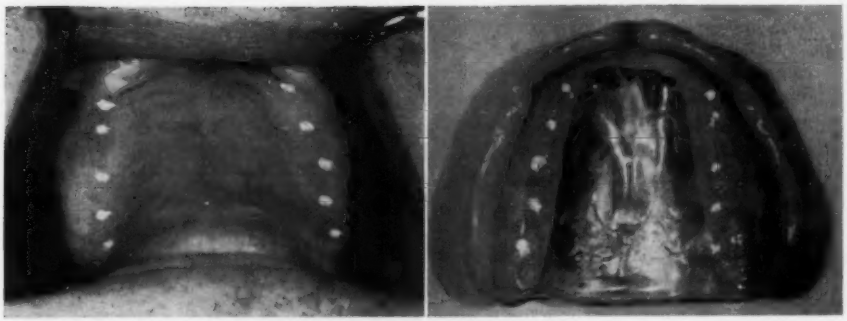


Fig. 4 • Left: Transfer paste applied to mucosal surface. Right: Accurate transfer of markings to prosthesis

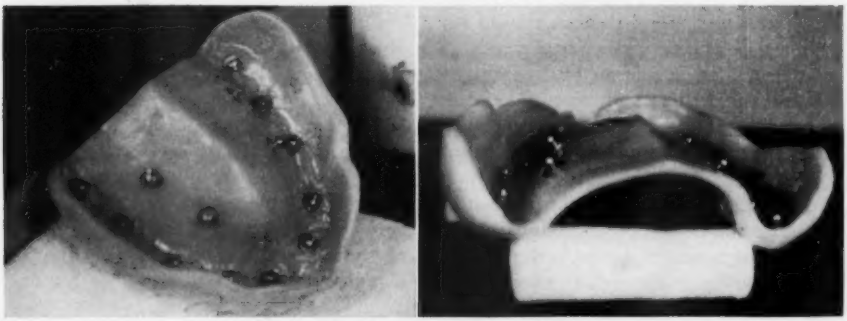


Fig. 5 • Left: Two intramucosal inserts are to be placed in palatal vault. Right: Lack of parallelism aids in retention

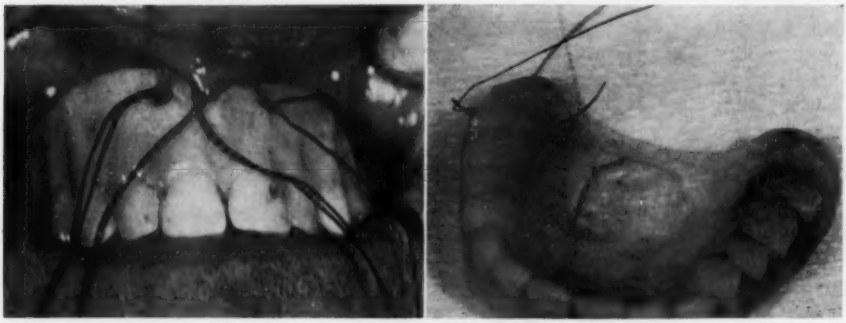


Fig. 6 • Left: Application of anterior suture. Right: Placement of left posterior suture

excess acrylic resin which may be forced out as the insert base is seated. The sluiceways can be cut with a no. 557 bur.

Management of Difficult Patients • Experience indicates that a minimum of ten days is required for primary healing and

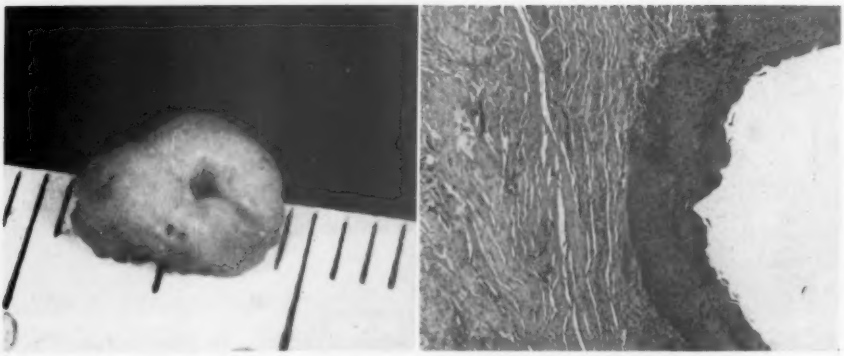


Fig. 7 • Left: Gross surgical specimen. Right: Histologic section

epithelization. The prosthesis should not be removed during this critical period or healing will be impaired. Many patients, because of hypersensitive gag reflexes, psychological factors, or extremely unretentive maxillae, cannot retain a denture for this period without removing it. In such instances it is the authors' practice to suture the denture into position.

Suturing is accomplished with a 1 inch, half-round, cutting edge needle and doubled no. 00 braided silk suture. Three retention sutures are placed. One is put into each tuberosity, and the third is passed through the soft tissues inferior to the anterior nasal spine (Fig. 6, left). No. 8 round bur holes are cut into the denture first, using the curve of the needle to guide in the placement of the buccal and palatal openings (Fig. 6, right). After the denture is seated finally, with all inserts in position, the occlusion is rechecked, and the sutures are placed. Not only does suturing fasten the denture mechanically, but it also serves as a psychological aid in determining the eventual successful outcome. Even the most difficult patient will hesitate to attempt to remove a denture which has been so treated. By the time the sutures have been removed, the patient has become accustomed to the prosthesis and the receptor sites have epithelized so that they can take over the task of retention.

Pharmacological management is valuable during these early trying days.[5] Ataraxics such as meprobamate, promazine or chlorpromazine are helpful. Narcotics are essential for relief of pain. Barbiturates may be needed. All local care must be left to the dentist: it is not suggested that the patient be allowed to rinse or apply local medication because of the danger that the denture may become unseated.

UNIVERSALITY OF PROCEDURE

There is no reason why the general practitioner cannot carry out the prescribed procedure with success. The armamentarium is simple and inexpensive, the surgical procedure is minor and complications are rare. Most difficult maxillary denture problems can be helped by employing the technic.

TISSUE RESPONSE

Four years after the successful epithelization of a receptor site, it was excised *in toto* for histopathological examination (Fig. 7). After it was removed, the denture was replaced with the original insert in position as a surgical splint. The healing tissue epithelized about the head into a new receptor site.

The report from Lester Cahn at the

Oral Pathology Laboratory of Mount Sinai Hospital stated as follows:

> The specimen consists of an epithelized slot. The epithelium is rather thick. There is an active basal layer. In the stroma several sclerotic vessels are evident. There is parakeratosis in the slot. No abnormalities are noted; the tissue is consistent with that found beneath dentures.

Grossly, the clinical appearance of a receptor site is healthy, pink, moist and normal. There are no signs of inflammation, edema, or variation of the expected stippled appearance of the epithelium.[3]

AUXILIARY USES OF INTRAMUCOSAL INSERTS

The intramucosal inserts are helpful in maxillary partial dentures. Occasionally the anterior teeth are extremely mobile and cannot be considered for use as abutment teeth for a partial denture. If extractions are contraindicated, an acrylic horseshoe-type maxillary partial denture may be constructed in a manner that will keep the anterior teeth slightly out of occlusion. When mucosal inserts are added to such a partial denture, it becomes independently retentive, without the aid of clasps. The longevity of the mobile incisors is prolonged, and when they are eventually lost, the transition to complete prothesis is facilitated.

For small, tissue-borne partial dentures, inserts are placed strategically and at varying angulations (Fig. 8, left).

The intramucosal inserts can be used to aid in removing claspless partial dentures, including precision attachment and spring-lock appliances. The inserts are processed into the buccal flange acrylic resin beneath the first denture tooth. They are processed more deeply into the plastic than is ordinarily prescribed, and they offer a simple, atraumatic and effective finger grasp for the patient to use in removing his partial denture (Fig. 8, right).

Intramucosal inserts are useful as an intermaxillary elastic hook in orthodontics or fracture reduction. The inserts are processed into the acrylic resin in each area that a hook would be required. Their polished heads are nonirritating to the soft tissues, and their constricted cervixes serve well for elastic anchorage.

The inserts are also used in constructing successful unilateral, free-end saddle partial dentures. The framework should be designed in a simple accepted fashion. A simple Bonwill clasp usually is not sufficient. There should be a back-action clasp, a compensating arm, a double clasp, a Roach-type clasp, or some similar additive to improve retention. A precision attachment or mesiodistal clasp is acceptable also. The retention loop for the saddle should be affixed to the partial denture frame with a distal end-type hinge stress breaker. The prosthesis is completed with acrylic teeth and saddle, and intramucosal inserts are placed at strategic points. A reasonably successful denture can be converted into a retentive and satisfactory one by the addition of the inserts.

After several successful maxillary unilateral free-end saddle partial dentures were completed, a mandibular denture was attempted. In this instance, preoperative probing of the denture-bearing mucosa revealed adequate thickness for seating of the insert heads, so several of the retentive devices were utilized. The unusually dense retromolar tissues in this instance proved a good source of retention after healing about the heads, and this denture proved to be acceptable. A combination of retentive clasping, stress breaker and intramucosal inserts offers a method for constructing unilateral free-end saddle partial dentures (Fig. 9 and 10).

Use of the intramucosal inserts in complete mandibular dentures is not tenable at present, because of the thin, friable, nonretentive nature of the tissues. In instances of extreme ridge resorption, the close proximity of the mandibular canal

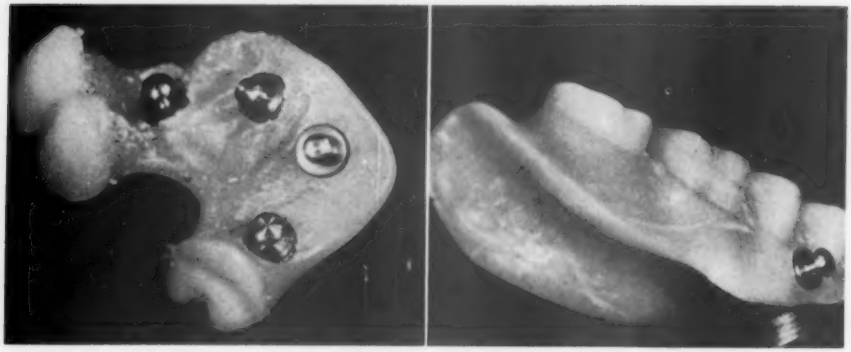


Fig. 8 • Left: Intramucosal inserts in tissue-borne partial denture. Right: Insert used as finger grasp in claspless partial denture, or as atraumatic intermaxillary hook for elastics

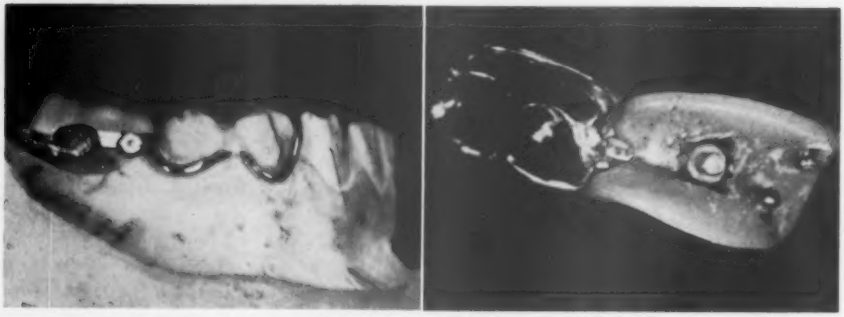


Fig. 9 • Left: Cast framework of unilateral, free-end saddle, mandibular partial denture showing retentive clasping, stress breaker hinge and retentive loop for acrylic saddle. Right: Partial denture with intramucosal inserts processed into tissue-borne surface

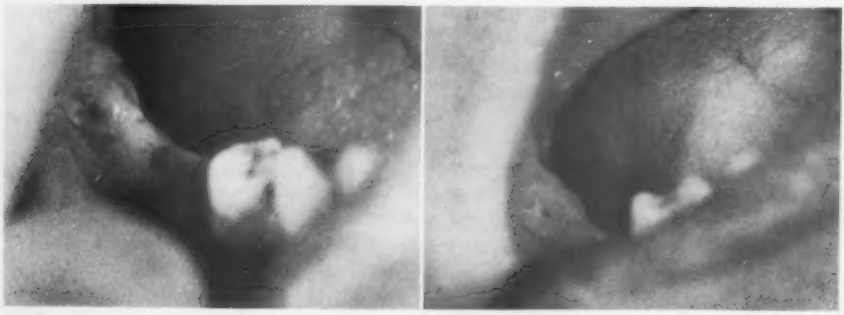


Fig. 10 • Left: Cruciform incisions about trephined receptor sites on day of operation. Right: Healed receptor sites, 21 days postoperatively

to the superior surface of the mandible does not allow sufficient depth for proper seating of the insert heads. Research is being conducted on adapting the use of the inserts to the mandible. At present, the use of the inserts in the mandible should be limited to free-end saddle dentures in instances in which a thick, dense retromolar pad exists.

Auxiliary uses for the inserts have been found, as follows: in claspless partial dentures to aid in removal; as an intermaxillary elastic hook in orthodontics and fracture reduction, and as an aid in constructing unilateral, free-end saddle partial dentures. *2120 Ocean Avenue*

SUMMARY

Recent improvements in design and insertion of intramucosal inserts are described. The base of the surgical indicator stylus, the head of the intramucosal insert, and the base-preparing bur have been redesigned. The use of a transfer paste for transferring marking of receptor sites to the tissue-borne surface of the denture and the cutting of sluiceways adjoining and at right angles to the receptacle have been found helpful.

*Assistant attending dental and oral surgeon, Mount Sinai Hospital, New York, and consulting oral surgeon, Corpus Christi Monastery, New York.

†Associate attending dentist, Unity Hospital, and oral surgery staff, Madison Park Hospital of Adelphi College.

1. Dahl, Gustav. Impianti sottoperiostali e "superplant." Rass. trim. odont. 37:25 Oct.-Dec. 1956.

2. Lew, Isaih, and Kestenbaum, Irving. Implant button technique for denture prosthesis. D. Digest 59:298 July 1953.

3. Cranin, A. N., and Cranin, S. L. Intramucosal insert: a method of maxillary denture stabilization. J.A.D.A. 57:188 Aug. 1958.

4. American Dental Association, Council on Dental Therapeutics. Accepted dental remedies, 1958. Chicago, American Dental Association, 1958, p. 182.

5. Cranin, A. N. Pharmacodynamics: pre- and postoperative management of the implant patient. J. Implant Den. 3:29 Nov. 1956.

Image of the Scientist • Exploration of the college-student image of the scientist was initiated in a series of unstructured interviews with college undergraduates at Wesleyan University. In these interviews, students described the scientist as being dedicated to his work and carrying it out with heroic devotion at the expense of concern with public affairs and even family responsibilities. The scientist was described as unsociable, introverted, and possessing few, if any, friends. Some students referred spontaneously to his high intelligence; others were more impressed by the precision of his thinking and the objectivity (that is, lack of emotional involvement) with which he handles most personal and professional problems. Two telling comments represent the common response of undergraduate men to the scientist. One student volunteered, "I wouldn't care to double-date with a scientist," and another student commented, "maybe it's not a good idea for him [the scientist] to be married." A number of students were impressed by the scientist's apparent need to proceed in his work regardless of other demands on his time. In general, the college students revealed in these interviews beliefs similar to those found among high school students. The scientist, to use the student phrase, "is not well rounded." *David C. Beardslee and Donald D. O'Dowd. The College-Student Image of the Scientist. Science 133:997 March 31, 1961.*

A new, long-lasting vehicle for the application of drugs to the oral mucous membranes

Austin H. Kutscher, D.D.S.; Edward V. Zegarelli, D.D.S., M.S.; Norman Roland, D.D.S.; Neal W. Chilton, D.D.S., M.P.H., and James L. Mercadante, D.D.S., New York

To ascertain the length of time that an adhesive vehicle (composed of gelatin, pectin and carboxymethylcellulose) could be maintained at various sites of application in the mouth, 762 applications of 250 mg. each were made in the mouths of nine volunteer subjects. The duration ranged from about one hour to in excess of two hours, depending on the region to which the vehicle was applied. This vehicle apparently facilitates the prolonged topical application of therapeutic agents to lesions of the oral mucous membranes.

Many lesions of the skin and mucous membrane are often best treated by the topical application of drugs. These drugs may be prepared in demulcent, protective or absorbent vehicles.[1] A vehicle for the incorporation and application of drugs to the oral mucous membrane should have certain specific qualities: (1) it should not irritate the mucosal surfaces, (2) it should be innocuous to the gastrointestinal system when ingested, (3) it should be compatible with the active agents which it was intended to carry, (4) it should be pleasant in feel and flavor, (5) it should be easily applied, and (6) it should remain adherent to the surface to which it is applied for as long a period of time as possible before saliva, muscular action, and movement of the tissues mechanically remove it from the tissue surface.

In terms of the last criterion in particular, there is at this time no completely suitable vehicle for the maintenance of medicaments on the oral mucosal surfaces. However, Rothner, Cobe, Rosenthal, and Bailin[2] have reported that carboxymethylcellulose in petrolatum represented an improved vehicle for the incorporation of penicillin. Agents such as petrolatum, various oils, tincture of benzoin, and so forth remain at the site of application for several moments only. Thus, attempts at treatment of chronic lesions of the oral mucous membranes (such as chronic marginal gingivitis, the keratoses, desquamative stomatitis, recurrent ulcerative stomatitis, pemphigus, erythema multiforme, drug eruptions, and so forth) with topical medications have always been relatively ineffective because of the difficulty in maintaining the medicaments at the site of application.

The adhesive vehicle used in this study has been described in another report.[3]

METHOD

An investigation dealing with the aforementioned vehicle was undertaken to ascertain the length of time this material will be maintained at various sites of application in the mouth. The volunteer subjects were dental students, eight men and one woman. Their ages ranged from 20 to 22 years.

The directions given the subjects were similar to those given to clinic patients who were treated with the same adhesive vehicle into which active medications were incorporated. The subjects were told how to apply the material to the various regions and the quantity (250 mg.) of material to use. There probably was about a 25 per cent variation in the amount of material used by each of the subjects.

The subjects were requested to note subjectively and to test objectively (with the tongue) for the presence of the vehicle at the site of application at approximately five minute intervals. In all instances the times recorded were minimum figures measured from the last time check at which the vehicle was felt. The subjects were to note the time when all the material had disappeared.

The regions tested were: (1) the anterior gingivae and mucobuccal fold in the upper cuspid area, (2) the mucobuccal fold in the region of the lower first molar, (3) the dorsum of the tongue near the lateral border, (4) the anterior region (midline) of the vault of the hard palate, (5) the center of the buccal mucosa, (6) the floor of the mouth in the incisor (midline) region, and (7) the mucobuccal fold and mucosa (midline) of the lower lip. The sites of application, where possible, were alternated between the left and right sides on various days. The regions studied were chosen to allow for the variations of physical activity observed in different parts of the mouth.

A report form was completed by each subject during the course of each daily application. The adhesive vehicle was usually applied after dinner. The subjects were asked not to eat solid food during the daily experimental period. No other restrictions were placed on their activities.

RESULTS

Seven hundred and sixty-two applications of adhesive vehicle were made. The observations derived from the data obtained are summarized in the table.

A shorter duration of maintenance occurred in those regions which are more motile, or are exposed to the action of a motile organ, or are more subject to the "washing action" of saliva. Those regions which are more sheltered exhibited a longer duration of vehicle contact. The "shorter" duration was approximately one hour whereas the "longer" duration was just in excess of two hours.

All subjects reported that the material was innocuous and not unpleasant. Objectively, no evidence of inflammation, ulcers, or any other side reaction was noted after the repeated use of the vehicle. All subjects reported that, when first applied, the vehicle caused a sensation of dryness; however, after a short period of time the sensation of dryness disappeared.

DISCUSSION

During earlier studies of this vehicle in clinical tests on 119 patients, no evidence of irritation, other side reactions or toxicity, either local or systemic, was noted. In addition, as reported previously, this adhesive vehicle was used as a denture adhesive on 100 patients for periods of time ranging from one day to four weeks. There was no evidence of tissue irritation.[3] Thus it appears that oral tissues accept this adhesive vehicle quite well.

The composition of the material used in this study varied in particle size and proportions of solids (gelatin, pectin, and carboxymethylcellulose) because several

Table • Results of adhesive vehicle investigation on volunteer subjects

Site of application	Number of subjects	Number of readings per subject	Total number of readings	Average duration of contact in minutes	Standard deviation(s) in minutes
Anterior gingiva and mucobuccal fold in the upper cuspid region	8	12	96	136.2	49.9
Mucobuccal fold in the region of the lower first molar	9	8	72	121.9	39.6
Dorsum of tongue near the lateral border	9	8	72	54.4	23.6
Anterior region (midline) of the vault of the hard palate	8	18	144	57.8	22.6
Center of the buccal mucosa	8	18	144	64.6	27.6
Floor of mouth in the incisor (midline) region	5	18	90	62.7	26.6
Mucobuccal fold and mucosa (midline) of the lower lip	8	18	144	101.5	34.4

batches were used. However, all batches represented essentially the same formula and thus no differentiation was made among them.

Preliminary analyses disclosed that there were no statistically significant differences between the various formulas in terms of duration.[4]

Since most oral mucosal surfaces lack a keratotic layer, they are supposedly more susceptible to irritation. In the course of this study, the components (gelatin, pectin, and carboxymethylcellulose in the mineral oil-polyethylene base) were found to be compatible with the health of the oral mucosa despite repeated application.

Since materials placed in the mouth are generally swallowed, any systemic activity which a vehicle possesses must be considered. The effects of the components of this vehicle (carboxymethylcellulose, pectin, gelatin, and a mineral oil-polyethylene base) have all been extensively studied.[1,2,5-7] Each has been found to be without significant deleterious, toxic, or allergenic properties.

Some patients may consider a tasteless medication objectionable in some ways. However, although flavors can be introduced readily into this vehicle, such flavoring agents may themselves cause gastrointestinal irritation and occasionally hypersensitivity reactions.

As a paste, the adhesive vehicle is easily applied with a finger, tongue blade, or cotton swab. Although the tissues do not need to be dried prior to an application, swallowing before applying the material is desirable and may, on occasion, be necessary.

Preliminary investigations concerning the compatibility of this vehicle with various drugs suggest that full compatibility usually exists.

SUMMARY

A new adhesive vehicle intended to serve as a carrier for the topical application of drugs to the oral mucous membranes was studied on nine subjects. This vehicle may also be useful for its protective action per se. The duration of maintenance of

the adhesive vehicle to various regions of the mouth was recorded after 762 applications. The requirements for a nontoxic, nonirritating, innocuous vehicle for the topical application of drugs to the oral mucosa are apparently present in this vehicle.

The approximate average duration of adhesive action (maintenance in the region to which it is applied) was as follows:

The anterior gingivae and mucobuccal fold in the upper cuspid region: 2¼ hours.

The mucobuccal fold in the region of the lower first molar: 2 hours.

The dorsum of the tongue near the lateral border: 1 hour.

The anterior region (midline) of the vault of the hard palate: 1 hour.

The center of the buccal mucosa: 1 hour.

The floor of the mouth in the incisor (midline) region: 1 hour.

The mucobuccal fold and mucosa (midline) of the lower lip: 1 2/3 hours.

Individual applications in each of these regions lasted, on occasion, for periods considerably in excess of these times, dependent on the eating, drinking, speaking, or smoking activity of the subjects. This vehicle apparently facilitates the prolonged topical application of therapeutic agents to lesions of the oral mucous membranes in various regions of the mouth. *630 West 168 Street*

The adhesive vehicle used in this study (Orabase) was supplied for experimental purposes by the Squibb Institute for Medical Research, New Brunswick, N. J., and contains gelatin, pectin, carboxymethylcellulose and Plastibase.

From the division of stomatology, School of Dental and Oral Surgery, Columbia University; School of Public Health and Administrative Medicine, Columbia University; and the Institute of Cancer Research, College of Physicians and Surgeons, Columbia University, New York.

1. Mutimer, M., and others. Modern ointment base technology. I. Properties of hydrocarbon gels. J. Am. Pharm. Ass. Sc. Ed. 45:101 Feb. 1956.

2. Osol, A., and Farrar, G., Jr. The dispensatory of the United States of America, ed. 25. Philadelphia, Lippincott, 1955, p. 979.

3. Kutscher, A. H., and others. A new vehicle (orabase) for the application of drugs to the oral mucous membranes. Oral Surg., Oral Med. & Oral Path. 12:1080 Sept. 1959.

4. Chilton, N. W., and Fertig, J. W. Studies in the design and analysis of dental experiments. I. The importance of equal sample sizes in experiments. J.D. Res. 39:53 Jan.-Feb. 1960.

5. Martin, E., and Cook, F. Remington's practice of pharmacy, ed. 11. Easton, Pa., Mack Publishing Co., 1956, p. 189.

6. Osol, A., and Farrar, G., Jr. The dispensatory of the United States of America, ed. 25. Philadelphia, Lippincott, 1955, p. 1264.

7. Mutimer, M., and others. Modern ointment base technology. II. Comparative evaluation of bases. J. Am. Pharm. Ass. Sc. Ed. 45:212 April 1956.

The First Tumor Clinic • Started in 1919, this [the Tumor Clinic of the Massachusetts General Hospital, Cambridge, Mass.] was the first clinic of this kind established in a general hospital. The objective was to review and use the combined opinions of physicians, surgeons, radiologists —in fact representatives from every service—to select the best method of treatment for cancer patients, to follow up the results, and to make a complete record of all cases referred. It was not a treatment clinic, so when a decision was reached the patient was referred to the proper department for treatment. In this way the resources of all members of the staff and all Hospital departments were made available. There are now over 700 tumor clinics in hospitals in the United States. *N. W. Faxon, The Massachusetts General Hospital 1935-1955, Cambridge, Mass., 1959.*

Silicate cements and pulpal degeneration

Richard H. Roydhouse, B.D.S., Rochester, N. Y.*

A review of the histopathology of pulps beneath unlined silicate cement restorations and some experiments with the material in various leaches creates doubt about the theory that the acid produced by silicate cements could be wholly responsible for the damage caused to pulps. Other constituents in the silicate cement can be shown as possible causes of the pathologic changes.

In descriptions[1-7] of the histologic changes in pulps beneath unlined silicate restorations, some common observations are as follows:

1. The depth of the cavity determines the degree of damage; when the silicate cement lies within 0.5 mm. of the pulp, progressive degeneration occurs.

2. Two main reactions are distinguished:

a. Initial. This reaction has been attributed to cavity preparation and toilet. When zinc phosphate cements are applied to dentin, similar initial changes occur.

b. Progressive. Unlike other restorative materials, silicate cement in contact with dentin seems to interfere with the normal reparative processes in the pulp. Translucent barriers, secondary dentin and similar calcific barriers may not form; the mass of collagenous material appearing in the region of the pulp associated with the dentin under the silicate restoration, may not calcify. A progressive degeneration leading to necrosis and infection occurs frequently.

3. Severe reactions occur in young teeth.

4. The reaction is altered if zinc phosphate cement is placed beneath the silicate cement as a lining; the initial damage may occur but the progressive degeneration does not follow.

In an initial reaction the clinical signs are of no greater intensity or incidence than when zinc phosphate cements are used.

The signs and symptoms of pulp necrosis, infection and spread of infection often occur 6 to 12 months or more later; frequently the patient has not been aware of any changes before an acute apical condition is formed.

After an initial irritant effect which may also be due to cavity preparation and toilet, the silicate cement seems in some way to cause a progressive degeneration of the pulp. The continuing effect appears not to produce any symptoms of subacute inflammation.

SILICATE CEMENT CONSTITUENTS

The restoration must contain some chemical or chemicals that affect pulpal physiology. The powder[8] contains silica, alumina, lime, sodium and calcium fluorides, cryolite and combinations of these. The liquid contains phosphate, aluminum, zinc and magnesium ions. A spectro-

chemical analysis of a leach[9] shows the following percentages of ions:

sodium	20
phosphorus	10-20
aluminum	5- 6
silicon	4- 5
calcium	1- 2

Also, 0.007 per cent of fluoride ions[10] has been detected. A cement leach is acidic because of the use of orthophosphoric acid in preparation of the liquid. Hence the source of the pathologic change should lie in the constituents listed.

ACID PRODUCTION BY SILICATE CEMENTS

In an experiment (to be reported fully elsewhere)[11] the production of acid by a set silicate cement under certain known conditions was estimated. The method of estimation was not associated with pH measurement, for this does not indicate the capacity of a material or a solution to react with acid or bases. The pH is a measurement of hydrogen ion concentration at a particular time; the significance of results is doubtful if pH is associated with solid materials. In determining the pH of cements and their leaches, investigators in the past have frequently reported pH's of 5.5 to 7.0; distilled water left exposed to the normal atmosphere will absorb sufficient carbon dioxide to produce these values.

Thin cylindrical wafers, 2.5 mm. in diameter, of silicate cement of known composition were placed in 10 ml. of various solutions under various conditions. After 48 hours the amount of acid in the solution was determined by titration against a standardized caustic soda solution; hence the amount of acid produced under given conditions by a given surface area of silicate cement could be determined. The determinations of the amount of acid produced under various circumstances were compared using the analysis of variance.

Three leaches were used and the acid production varied. The leaches were distilled water, Ringer's solution, Ringer's solution with buffer (buffered from pH 6.0 to 7.0); the latter two were physiological fluids of standard composition used in biochemical laboratories. Silicate cement produced most acid in the Ringer's solution with buffer, the least in the Ringer's solution. In the former the acid produced was rapidly neutralized by the buffer and in the latter some surface reaction seemed to occur. For comparison the means of the acid production in milliliters of one-hundredth-normal acid per 5 ml. of leach were as follows:

Distilled water	3.44
Ringer's solution	3.21
Ringer's solution with buffer	5.82

The final pH of the distilled water, measured by a pH meter, was about 4.0, whereas the pH of the buffered Ringer's solution was about 6.0; pH is not a valid indicator of acid production.

A change in the area of the cement surface altered the amount of acid produced. A reduction of area by about half reduced the acid production approximately by a third.

The presence of tooth material (a disk of dentin and enamel) in the leach reduced the amount of acid appearing in the leach. Tooth material is alkaline in nature and would "soak" up some of the acid produced.

If the silicate was placed in fresh solution at various intervals, the acid production fell off very rapidly. Although the production continued, the amount per day was scarcely discernible.

Disks of zinc phosphate cement placed in a leach within 45 minutes of mixing showed a slight initial acid production, but after 24 hours they became alkaline in reaction and would remove acid from solutions.

The amount of acid produced under favorable conditions for acid production

by a large piece of silicate cement is small and when the scale is reduced to the size of silicate restorations and the quantity of fluid in dentinal tubules, the amount of acid then produced would seem to be very small.

The physiology of dentin is not clear but studies[12,13] have shown that circulation takes place within the dentinal tubules: the Tomes' fibrils seem to secrete fluid that very likely passes into the lymphatic system[14] that surrounds the odontoblast layer. Tissue fluids are strong buffers, particularly for acid. In other words, acid added to tissue fluids alters the pH but little; the tissue fluids prevent changes in pH, that is, not acid content but the degree of disassociation of ions. Cells of the mesenchymal tissues are particularly susceptible to changes in pH and their death is rapid when the pH changes to below 7.0. Also in the dentinal tubules are quantities of protein and the protein would also react with any acid. Tooth material is soluble at pH's less than 6.5 and would also tend to neutralize the acid.

With all the acid-neutralizing mechanisms present and with the small amount of acid produced added to the fact that pulpal degeneration occurs over a long period, it seems unlikely that the acid production of silicate cements is the whole cause of pulpal degeneration. Clinically, children's teeth show a more rapid degenerative response to silicate cements, yet the circulation of tissue fluid and general anti-acid response of the young pulps should make degeneration less likely if acid were the cause.

Other theories blame "neurotropes"[15] consisting of aluminophosphates; in the source cited it was noted that the slow death occurred over weeks or months and only with those cements with alumina in them. Crowell[10] doubted that 0.007 per cent of fluoride ions could be blamed.

If the acid theory is unsatisfactory, then the cause must be sought among other constituents: although flouride ions may be a cause of pulpal irritation when applied in quantity to dentin surfaces, the reactivity of fluoride ions with apatite would make likely the removal of very small concentrations that would occur in a leach because of the fluid in dentinal tubules.

POSSIBLE CAUSES OF PULPAL DEGENERATION

Other possible causes of pulpal changes can be found. It is assumed that the leaching of the unlined cement and the passage of this solution down the tubules must be the way in which the pulp is affected. The presence of aluminum oxide and silica may be significant. Aluminum ions act as astringents and antiseptics; cells and bacteria may concentrate these ions about the cell membrane with fatal effects on the pulp. This "great but slow activity of low concentrations" is called the oligodynamic action.[16,17] Both aluminum ions and colloidal silicic acid affect blood vessels and cells.[18] The aluminum ions cause a constriction whereas the silicic acid may also cause agglutination, zoning and blocking of erythrocytes.[19] Quartz readily dissolves in tissue fluid (9 mg. per hundred milliliters in 18 days)[20] and this soluble fraction may react with the precursors of collagen[21] to produce a mass of fibrotic tissue. This seems to occur in lymphatic systems[22] into which the solution drains, and what might be simply described as protein precipitation or polymerization thus lowers the resistance to infection of the affected region. There is sufficient evidence in other fields to explain the action of silicate cement leach on the grounds of a slow poison which by affecting the lymphatic and vascular systems lowers the vitality and resistance of the pulp. The greater circulation in young teeth thus operates to their disadvantage in this respect, by hastening the effects.

In recent literature, the effects of silicate minerals in the body are attributed to an antigen-antibody reaction, and hence no account need be taken of quantities of leach or solution in estimating the effects of the silica. For example, it has been shown that treatment of silicate minerals with hydrofluoric acid reduces the solubility considerably (from 30 to 1 in any given units) and yet its fibrogenicity thereafter is unaffected.[23] The analysis of tissue taken from regions of fibrosis about silica particles in lungs by Ceppellini and Pernis[24] shows the existence of a fraction which "may be identified with a plasma-globulin having antigenic properties." This evidence is supported by other studies[25] where antibody formation in animals was caused by parenteral administration of quartz coated with homologous serum albumin. Thus the idea is rapidly gaining acceptance[26] that silicate minerals in contact with tissue fluids may produce an antigen, and the antibody response to this causes the formation of fibrous tissue in regions exposed to leach from these minerals.

DISCUSSION

When these observations are considered in relation to pulpal degeneration beneath silicate cements, even more doubt is created about the acid theory. The histopathology of such pulpal degenerations would support a theory associated with a slow poison. Even more striking, however, is the antigen-antibody effect, for even if the amount of leaching in a tooth is very small, and this it must be, degeneration occurs nevertheless.

The function of a lining cement could be the prevention of contact between silicate cement and tissue fluid, first by mechanical barriers and second by permitting the formation of calcific barriers. The alkaline nature of set zinc phosphate cement may also depress the solubility of the alumino-silico-phosphates, for these latter complexes have solubilities markedly affected by the pH of surrounding solutions.

CONCLUSIONS

The pulpal degeneration that occurs under unlined silicate restorations is due to the interaction of the constituents of the cements and the physiological processes in the dentin. The cause of this degeneration is probably a combination of pathogenic processes. Acid production by the cement seems to be a minor influence, for the histopathology, signs and symptoms would support a theory of the slow accumulation of poisons affecting the lympthatic and vascular systems, or alternatively an antigen-antibody type of response to dissolved silica fractions.

Claims about the pH of cements would seem to be misleading in view of the interpretation of this value for set materials as well as the doubtful relation between this entity and pulpal degeneration. The physiology of dentin is such that the neutralization of any acid leached from the cement by the tissue fluid seems most likely.

This analysis also poses the question: Is silica a suitable constituent of restorative materials in view of its properties?

SUMMARY

The antigen-antibody response to silicate minerals and possible slow accumulation of "poisons" from alumino-silico-phosphates have been described. When these are considered in relation to the physiology of dentin and pulp and to the histopathology, clinical signs, symptoms and history of pulpal changes beneath unlined silicate cement restorations, the acid production of silicate cement within a tooth seems to be an unlikely single cause of pulpal degeneration.

This work was carried out at the University of Otago Dental School, Dunedin, New Zealand.

*Senior Research Fellow, Eastman Dental Dispensary.

1. Manley, E. B. Preliminary investigation into the reaction of the pulp to various filling materials. Brit. D. J. 60:321 April 1, 1936.

2. Manley, E. B. Experimental investigation into the early effects of various filling materials on the human pulp. Proc. Roy. Soc. Med. 34:693 Sept. 1941.

3. Manley, E. B. Pulp reactions to dental cements. Proc. Roy. Soc. Med. 36:488 July 1943.

4. Shroff, F. R. Effects of filling materials on the dental pulp. New Zealand D. J. 42:99 July 1946.

5. Manley, E. B. Review of pulp reactions to chemical irritation. Internat. D. J. 1:36 Dec. 1950.

6. Zander, H. A. Reaction of dental pulps to silicate cements. J.A.D.A. 33:1233 Oct. 1946.

7. Massler, Maury. Effects of filling materials on the pulp. New York J. Den. 26:183 May 1956.

8. Skinner, E. W. Science of dental materials, ed. 4. Philadelphia, W. B. Saunders Co., 1954, p. 152.

9. Brauer, F. J.; White, E. E., Jr., and Burns, C. L. Investigations to reduce the solubility of silicate cement. (Abst.) J. D. Res. 37:89 Feb. 1958.

10. Crowell, W. S. Physical chemistry of dental cements. J.A.D.A. 14:1030 June 1927.

11. Roydhouse, R. H. Silicate cements and acid production. J. D. Res. 40:258 March-April 1961.

12. Fish, E. W. Experimental investigation of enamel, dentine and the dental pulp. London, John J. Bale, Sons & Danielsson, Ltd., 1932.

13. Bodecker, C. F., and Lefkowitz, W. Further observations on vital staining of dentin and enamel. J. D. Res. 25:387 Oct. 1946.

14. Noyes, F. B. Review of the work on the lymphatics of dental origin. J.A.D.A. 14:714 April 1927.

15. Ehrlich, P. Quoted by Tompkins, H. E. Silicate cements and "neurotropism." D. Items Interest 44:881 Dec. 1922.

16. Gaddum, J. H. Pharmacology, ed. 4. London, Oxford University Press, 1953.

17. Soine, T. O., and Wilson, C. O. Rogers' Textbook of inorganic pharmaceutical chemistry, ed. 5. London, Henry Kimpton, 1952.

18. Sollmann, T. H. Manual of pharmacology and its application to therapeutics and toxicology, ed. 7. Philadelphia, W. B. Saunders Co., 1948.

19. Renton, P. H., and Hancock, J. A. Antibody-like effects of colloidal silica. Vox Sanguinis (Basel) 2:117 March 1957.

20. King, E. J., and McGeorge, M. Biochemistry of silicic acid: the solution and excretion of silica. Biochem J. 32:426 Feb. 1938.

21. Holt, P. F. Pneumoconiosis. London, Edward Arnold Ltd., 1957.

22. Hadfield, Garfield, and Garrod, L. P. Recent advances in pathology, ed. 5. London, J. & A. Churchill Ltd., 1947.

23. Englebrecht, F. M., and others. Fibrosis and collagen in rats' lungs produced by etched and unetched free silica dusts. A.M.A. Arch. Indust. Health 17:287 April 1958.

24. Ceppellini, R., and Pernis, B. Presence of plasma globulins in the hyaline tissue in cases of silicosis. Nature 181:55 Jan. 4, 1958.

25. Antweiler, H., and Hirsch, E. Tierexperimentelle Untersuchungen zur Frage der Entstehung von Antikörpern bei der Entwicklung der Silikose. Arch. Gewerbepath. Gewerbehyg. 14:678, 1956.

26. Collins, D. H., editor. Modern trends in pathology. London, Butterworth & Co., 1959.

Enzymes • Enzymes can be defined simply as catalysts produced by living cells but independent of living cells in their operation. They differ from inorganic catalysts in being rather more delicate; most of them are easily destroyed by heat, they are active over only a limited pH range and are destroyed by acids or alkalies. They are all protein in nature and are characteristically specific in their actions. The substance upon which an enzyme acts is known as the substrate. Most enzymes are named after their substrates by adding the suffix "ase." Thus amylase acts on starch, uricase on uric acid, lactase on lactose, and so on. . . . In many cases enzymes can be extracted from the cells by grinding them with quartz sand or by disrupting the cells either in a mechanical homogenizer or with ultrasonic waves, and then extracting the debris with water or buffer solutions. It is only in the case of the enzymes which are soluble in water or in buffers, and which can therefore be extracted, that purification is possible. In other cases the enzymes remain in the cellular debris. . . . The catalytic activity of enzymes persists at dilutions so great that chemical tests cannot detect the presence of protein. Thus the presence of the enzyme catalase which decomposes hydrogen peroxide can be demonstrated at a dilution of 1 gram of enzyme in 25,000 litres of water. *G. H. Bell, J. N. Davidson and H. Scarborough, Textbook of Physiology and Biochemistry, 1959.*

A consideration of personality factors in the use of hypnosis in dentistry

S. Irwin Shaw, D.M.D., M.Ed., Detroit

The dentist contemplating the use of hypnosis should consider the unique personality of each patient. Psychoneurotic patients may be subject to anxiety neurosis, hysteria, neurasthenia, psychasthenia, dissociation and somatization. Observation of the patient's behavior may disclose certain personality traits and behavior patterns. The psychological needs as well as the dental needs of the patient must be considered in the use of hypnosis in dentistry.

There are many facets to the individual, and it is the sum total of these attitudes and behavior tendencies that constitutes the entity known as his individual personality. For the hypnodontist, an understanding of the prospective patient-subject's personality-complex is an absolute requisite if the practice of hypnodontia is to be established or maintained on a solid foundation.

It is generally accepted that the mere ability to construct a set of dentures or place a filling does not in itself qualify an individual for the practice of dentistry. Because conditions in the oral cavity affect and are affected by conditions throughout the organism, a background of anatomy, bacteriology, pathology and other subjects is necessary for the dentist to serve his patient adequately. By the same token, the simple ability to use a hypnotic induction technic should not predispose the dentist to use it in his practice, for even when it is employed for specific dental ends, hypnosis unavoidably involves not only the subject's mental set toward dental work, but larger and undefined areas of the mind.[1]

A proper approach to the use of hypnosis in dentistry is a cautious one in which the dentist considers at all times the patient's individual and unique personality.

The personality factors are an outgrowth of previously experienced problems and adaptations,[2-5] and the healthy individual emerges with a pattern of adaptations which are useful and beneficial to him in his activities and which allow him to perceive and evaluate reality clearly and thus effectively interact with it.

When the complex of adaptations does not assist the individual and, in fact, impedes his effective relations with reality and with other individuals, he may be classified as "abnormal." The "abnormal" are classified, in turn, as psychoneurotic and as psychotic. The psychoneuroses are purely functional in origin, whereas the psychoses may be either functional or structural. The structural type of psychosis is associated with organic disorders of the brain or nervous system.

The psychoneurotic does not undergo

a complete change in personality. Except for his unusual behavior due to inner anxiety, he is unchanged in his relations with others. He experiences a partial inability to handle reality. In contrast, the psychotic has accepted a world of fantasy and has broken with reality.[2, 5, 6]

It may be assumed that the dentist in private practice will seldom be confronted by the abnormal patient who is completely out of contact with reality. Therefore, a description of the types of psychoses—schizophrenic, manic-depressive and paranoiac—as well as the mental disorders associated with toxic or organic brain pathology, will be omitted, and consideration will be given to the psychoneuroses.

These are classified descriptively as anxiety neurosis, hysteria, neurasthenia, psychasthenia, dissociation and somatization.

In anxiety neurosis the personality is subject to vague free-floating anxiety which has no specific object. Such feelings may accumulate periodically into acute attacks that produce symptoms of palpitation, difficult breathing, dizziness, profuse perspiration, cold hands, dilated pupils and fainting, sometimes accompanied by apprehensions about death.

In hysteria neurosis or conversion hysteria, the individual manifests a high degree of suggestibility with unconscious imitation of organic illness but usually does not show the severe concern that he would with a true disability. It should be mentioned that such indifference to organic symptoms is found also in patients who have frontal lobe lesions, and this differentiation should be noted when the dentist is considering the patient and his lack of concern about organic disturbances.[5]

In neurasthenia the individual is continuously tired both physically and mentally, and he complains of many unassociated symptoms. Within this classification might be included the hypochondriac, who is excessively concerned about his health, and the neurotic depressive, who is extremely discouraged over his symptoms.

In psychasthenia there is a repetitious persistence of fears, symptoms or compulsive behavior which the patient himself recognizes as irrational. This classification includes (1) phobic reactions, in which the unconscious anxiety and apprehension is displaced by a recognized fear of something that appears to be unavoidable (such as nystophobia, acrophobia or zoophobia), and (2) obsessive-compulsive reactions, in which repetitious thoughts and actions persist in spite of the patient's understanding that they are irrational. (These include handwashing, counting figures, kleptomania and dypsomania.)

The dissociative type of personality sets up a condition of fugue or amnesia as a defense to overcome his deep-seated anxiety, whereas in the somatization type, the psychological stress associated with anxiety is diverted into the body by means of the autonomic nervous system to produce, through prolongation or persistent repetition, organic symptoms of undetermined origin, such as certain forms of asthma, stomach ulcer, heart conditions and various skin disorders.

In addition to the psychoneurotic personalities outlined, there is the character defective known as the sociopathic or psychopathic personality whose behavior is due to neither neurosis, psychosis nor mental deficiency. Such individuals appear to be totally without conscience or sense of responsibility, and they follow a distorted pattern of asocial attitudes and pathologically delinquent behavior. They may be difficult to contend with and will sometimes offer a challenge toward developing rapport.

Because each individual is the product of his earlier development, and has many complexities within his personality, the dentist employing hypnosis must be careful not to use suggestions which might stimulate into activity latent repressed

conflicts, thereby producing abnormal behavior in the patient.

OVERT BEHAVIOR PATTERNS IN THE PSYCHONEUROTIC PERSONALITY

Although psychologists have different methods available for evaluating the character, temperament, interests, abilities and other personality factors of their patients,[7-8] the average practitioner can resort only to using the interview method for history taking, or he can prepare a questionnaire for use in determining the health, habits and past experiences of the patient. The answers could be sufficiently enlightening to the adequately trained dentist to enable him to differentiate between the insecure patient with possible unconscious conflicts and the self-reliant personality capable of facing reality.

Close observation of the patient's overt behavior—his mannerisms and expressive movements—also may disclose certain traits. The following behavior patterns are indicative of some of the neurotic types of personality.

1. The patient showing signs of anxiety neurosis may be the individual who has a worried look and a hesitating manner when he shakes hands in greeting, with the hands noticeably moist with perspiration. He also sits on the edge of the chair clenching his hands. In the case of a woman, she sits twisting her handkerchief or the handle of her pocketbook. While in the dental chair, this patient may ask for permission to smoke, and as a rule he lights one cigarette after another in succession, discarding them when they are only half smoked.

2. The hysteria neurotic is more likely to be a woman than a man, and the behavior of this type of patient is inconsistent and unpredictable in the dental office, where the conversion reaction may be directed to the mouth. She shows extreme apprehension, and may actually shed tears while protesting her fears of the work to be done. She may show beads of perspiration on the upper lip and forehead, may complain of dizziness or breathing difficulties or may even faint in the dental chair.

Because the anxiety of this type of personality is associated with disturbances which occurred during the phallic period of development, the patient may show definite fear of an injection, sometimes bordering on panic, or in extreme cases will reject the use of any dental instrument in the mouth, even the mouth mirror.

Such a patient has an intense need for attention, approval and affection, and she may appear at the office in a low cut dress designed to win the admiration of the dentist. She may be very suggestible and can easily adopt any symptom inadvertently suggested, even in the waking state, so that in hypnodontia it would be well for the dentist to weigh seriously the question of whether to use hypnosis with this type of individual. If hypnosis is used, care should be taken to be explicit in the choice of words applied throughout the procedure so that no ambiguous meaning can stimulate the neurotic defense mechanisms of the patient through indirect association, thereby activating the neurosis to greater proportions.

3. The patient who talks profusely about his ailments and his numerous visits to physicians while elaborating about his many symptoms which appear to be vague in character, not only is unconsciously delaying the impending dental work, but also may be displaying a trait of the neurasthenic hypochondriac. Such a patient can be expected to return repeatedly, complaining of vague discomforts which he associates with the dental work done at a previous visit.

4. The obsessive-compulsive personality is usually preoccupied with details about himself and his relationship to others and is unusually concerned about what people think of him. He is neat,

orderly and precise and is prompt in keeping appointments. As a perfectionist, he tries hard to please everyone, including the dentist, so that he feels compelled to hide his emotions, and he appears to be cold, aloof and detached in the dental office. Even though conversation is reduced to a minimum, since the compulsive patient discusses only what he considers important, in a polite manner he could be highly resistant and challenging to the dentist.

5. The sociopathic personality is known for his deviant behavior, and has the reputation of doing as he pleases. As a patient he is indifferent in his attitude and can be perfectly calm in the dental office. He displays no overt signs of anxiety, sits back comfortably in the dental chair and makes himself overfamiliar with the office personnel. This personality can be very demanding. He is not agreeable to following instructions and invariably arrives late or breaks his appointment without notification.

6. The neurotic personality whose attitude is extremely vague, flat and unemotional in response to any questioning is one to be particularly careful with in considering the use of hypnosis. This type of individual, as distinguished from other neurotic types, is reluctant to talk, and when he does, it is in a very detached manner which accentuates his withdrawn attitude. Such a patient might have basic schizophrenic tendencies which could revert to psychotic symptoms when hypnosis is injudiciously used. Hypnodontia for this type of personality could entail some risk for the dentist. The following report of an incident which occurred in Detroit illustrates the need for recognizing the dental patient who might present serious difficulties when hypnosis is used.

A 16 year old girl recently attended a party of other teenagers, and she was only a spectator when a boy, also 16 years old, added to the evening's entertainment with a demonstration of hypnosis. After the party the girl walked to her home just a few blocks away, and when she got close to her house she suddenly became aware that she had no shoes on and had forgotten her pocketbook. She quickly returned, but as she entered the home where the party was given, she became hysterical and could not be restrained, so that the police had to be called. At the police station a physician recommended that she be taken to the Henry Ford Hospital for emergency treatment. There she was given a tranquilizer and sent home. The following morning the hysterical symptoms were still present, and the girl was taken to the Wayne County General Hospital for psychiatric consultation.

It is evident that this girl was probably disturbed already to the point at which she was ready for an escape into unreality, and at this particular time certain trigger mental mechanisms were set off when she watched an amateur demonstration of hypnosis. An unsuspecting hypnodontist could have produced the same reaction in the dental office if this girl had been his patient for hypnosis in dentistry.

With this brief outline of some of the abnormal personality traits, the dentist is cautioned to be extremely careful in his observations and deductions before coming to an unwarranted conclusion that, because of certain modes of behavior, a particular patient is a psychoneurotic. The observant, tactful and discriminating dentist makes use of what he sees and hears, not for labeling the patient but for recognizing the need to exercise greater care in his approach to the total personality of the patient. He is thus able to give full consideration to the individual's psychological needs as well as to his dental needs.

COMMENT

In conclusion, it might be said that the individual is such a complicated organism and so unique that, as a patient, no

part of him can be isolated from his whole being: the dentist must relate the mouth to the total personality. Until recently, modern methods of evaluating personality have been of little interest to the average dentist. In hypnodontia, however, the fact has long been recognized that the interpersonal relationships in the application of hypnosis involve the patient psychologically as well as orally. Knowing this, the hypnodontist must recognize the need to become better acquainted with methods for understanding and evaluating the personality. It is hoped that in the near future the curriculums of dental schools will include courses covering the dynamics of human behavior, the psychology of adjustment, abnormal psychology and other related subjects so that means of evaluating the personality factor will be available to every dentist as a solid foundation for the practice of hypnodontia.

18201 Cherrylawn Avenue

1. Shaw, S. I. Clinical applications of hypnosis in dentistry. Philadelphia, W. B. Saunders Co., 1958.

2. Coleman, J. C. Abnormal psychology and modern life. Chicago, Scott, Foresman & Co., 1950.

3. Hall, C. S. A primer of Freudian psychology. New York, World Publishing Co., 1954.

4. Ruch, F. L. Psychology and life. Chicago, Scott, Foresman & Co., 1953.

5. Ziskind, E. Psychophysiologic medicine. Philadelphia, Lea & Febiger, 1954.

6. Sadler, W. S. Modern psychiatry. St. Louis, C. V. Mosby Co., 1945.

7. Anderson, H. H., and Anderson, G. L. An introduction to projective techniques and other devices for understanding the dynamics of human behavior. New York, Prentice-Hall Inc., 1951.

8. Freeman, F. S. Theory and practice of psychological testing. New York, Henry Holt & Co., 1950.

The Brink of the Unknown • Perhaps a future generation, which knows the outcome of our present efforts, will look at them with some irony. They will see where we fumbled and they will work more consistently towards the target it indicates. So it will always be, but let us hope that they will not find any reason to criticize us because of a lack of that combination of steadfastness of purpose and flexibility of approach which alone can guarantee that the possibilities which we are exploring will have been tested to the full. Working at the edge of the development of human society is to work on the brink of the unknown. Much of what is done will one day prove to have been of little avail. That is no excuse for the failure to act in accordance with our best understanding, in recognition of its limits but with faith in the ultimate result of the creative evolution in which it is our privilege to cooperate. *Dag Hammarskjold, Context 1:18 Spring 1961.*

How the budget plan has affected my practice

C. E. Rutledge, D.D.S., Richmond, Calif.*

A budget plan for patients can mean the difference between success and failure in a dental practice. The dentist who insists on making proper financial arrangements is rendering his patients a service. A trained employee should discuss financial arrangements with the patient.

Payment for dental services describes a problem all dentists have worried about. A discussion of the budget plan in regard to its effect on my practice should be preceded by a brief explanation of how the plan can be presented to patients, and equally important, the reasons for, and the background of, budget plans as far as dentistry is concerned. R. W. Fonda, of Detroit, said in 1950 at San Francisco:

> We must realize, that in order to be successful, we have to adjust ourselves to the buying habits of our patients today; that we have to guide the patients' education in the right channel of a well-planned pattern of procedure. We must instill the desire for better dental health, and then give him a more liberal and convenient choice of payment. One of our greatest strides in modern dentistry is "practice building through credit granting."

These statements of Fonda's are truer than ever, for in this age of sight and sound advertising we are not competing with each other, but with every merchant in town. Installment credit throughout the nation is of stupendous proportion. Every phase of living is geared to the extension of credit with the use of budget payments.

What does the budget plan mean to my practice? In plain terms, it means the difference between success and failure. The methods and technic used in presenting a budget plan properly should carry over into all areas of credit extension in the dental practice. The budget plan has two basic patterns:

1. The plan operated through your office, sponsored by a state or component society using the facilities of a bank or outside agency, with or without recourse.
2. The plan operated through your office, using your own credit facilities.

Both plans are important. Both have a place in every well-planned, efficiently operated office.

The problems of the dentist in meeting his obligations as a professional man and his problems as the proprietor of a small business often seem to be incompatible. As a dentist he is rendering a health service and wants to render it as completely as possible to all who call on him. As a businessman he is faced with the necessity of meeting his expenses, of providing for his family and of realizing the best possible net return from his gross charges. There are a few dentists, with practices limited in size, who conduct their practices on a strictly cash

basis, just as there are dentists who pay almost no attention to the more commercial aspects of their profession. Without question, the ideal lies about midway between these extremes, but the location of this midpoint may be determined only by each dentist as an individual.

The initial problem, "payment for dental services" in its relation to "group practice," is the one with which I am most familiar. In fact the title of this article should be "How the Budget Plan Has Affected Our Practices." In a group it is imperative for success that this midpoint between extremes be found and mutually agreed upon. As they join the group, the young associates must be taught the principles of credit granting. Without this background and insistence by the men in the group that some standards be maintained, the credit experience of a group practice could be very poor. Young men in single practice find out the hard way, for they suddenly awaken to the fact that they can't meet their personal and office obligations. A young associate in a group can blithely go on for a much longer time unless controls are built in that will limit his extension of credit to patients.

A paragraph from the *Dental Business Office*[1] states:

> The field of financial arrangements is the most important one to the dental business office. Far too often accounts receivable remain just that, receivable and not received, just because no one ever sat down with the patient and discussed the relationship of fees to that patient's own income and expenses. It is unfortunate for the profession that this field of financial arrangements is also the place of most dismal failure for great numbers of dentists. The combination of human nature and the high cost of living makes it axiomatic that an account for which no definite arrangement is made will be slow pay at best. Since the one factor most responsible for delinquencies is sheer procrastination, it behooves the dentist to see that his patients realize that regular payments are expected. This can be done by an early, thorough, and friendly discussion of the patient's financial responsibility, when he embarks on a course of dental reconstruction.

Our entire society operates on a basis of trust and honesty. In fact the basis of all time payments or budget payment plans is trust. The patient trusts that the dentist will deliver the quality of care promised, and the dentist trusts that the patient will pay according to the budget plan. Realizing that this basic trust exists makes budget plans possible. We approach the financial arrangement not because people do not wish to pay their bills, but because the discussion must be centered around their ability to pay and their willingness to agree to a specific schedule of payments. Despite the patient's complete honesty and sincerity, he has other obligations which are at least equally demanding of his income and sometimes more so.

Financial arrangements are far from the purely commercial thing they seem to be at a first glance. Every dentist should realize that he renders his patients a definite service when he insists on making proper financial arrangements. Today, credit is an easy thing to obtain and use, hence its use should be guided, not haphazard. The most satisfactory financial arrangement will be made after the patient has had time to adjust his thinking from case presentation to case cost. This adjustment does not occur instantly at the chair, so the patient should have time to adjust his thinking to the impact of the quoted fee on his income.

This thinking time should not be stolen from a dentist's already short productive day. It should be the time of a well-trained employee. The employee is trained by the dentist to answer simple questions that the patient is usually unwilling to ask the dentist. In fact, this employee's opening remarks to the patient should be, "Mrs. Jones, I'm glad you've decided to have your mouth repaired and restored to health. Are there any questions you would like to ask me?" When this employee makes the financial arrangements, the dentist remains a purely professional man, interested only in

the health and welfare of the patient. This is most important. When the patient realizes that this employee is in a position of responsibility and that the dentist stands back of this person, the arrangements will be much stronger.

In 1957, approximately one fourth of the total gross payments in our practice were handled through budget payment plans, and the five months through May 1958 were about the same in proportion. The average loan in 1957 amounted to $285.25, whereas in 1958 for five months the average was $271.71. The office budget plan exceeds that of the bank budget plan by a small amount.

We agree in our office that we could not operate efficiently without both types of budget plan. The value of the bank plan to the practices of dentists in California generally is shown in a perusal of the amounts financed since the inception in 1950. The Los Angeles County Society, with 2,777 dentists participating, has brought $25,000,000 to the dentists and quality care to thousands of patients. The same thing has occurred in the California Dental Association where 2,450 dentists were participating and over $19,000,000 has been financed. Imagine the public relations improvement in California and in our office where the question "Doctor, how can I pay for dental care?" is humanly answered in a way the patients may accept. The attitudes of patients when presented with a budget payment plan are important.

We have kept a fairly accurate record of patient reactions. The first and most important is relief that there is a way to budget dental costs. So many patients are accustomed to buying on the installment plan that they accept our suggestions without question. Many patients start their conversation by saying, "Oh, I'll pay on completion," "I'll pay each visit" or "I'll pay on statement." Then an explanation is needed that one visit may be $10 and another $50 or that one month's statement for a family may be $50 whereas another may be $150. When this is done the patient usually is willing and anxious to arrange a definite budget plan. Occasionally, objections are raised that are answered by the "financial arranger," the employee trained by the dentist to complete these transactions. The first one usually is about the interest added to total dental costs or "I've always paid whenever I had $5 or $10. How come the doctor wants this financed?" or "Suppose difficulties arise, will the bank be as understanding as the doctor?" The employee certainly should be competent in answering questions because she has been trained for just such emergencies, and again the dentist is not involved in a commercial discussion.

On the financial arrangements made depends, to a great extent, the course of future relations between dentist and patient as well as between the dentist's office force and the patient. This is so important that it is doubtful that any dentist would challenge it, hence the effect of the budget plans on our office is one of mutual satisfaction.

2500 Bissell Avenue

*Chairman, Judicial Council, American Dental Association.

1. Rutledge, C. E. Dental business office. Philadelphia, Lea & Febiger, 1956, p. 14.

Dental service in a poliomyelitis respiratory and rehabilitation center

E. Thomas Carney, D.D.S., and Robert E. Merrill, M.D., Nashville, Tenn.*

In 1957 a dental service was instituted at the Vanderbilt University Poliomyelitis Respiratory and Rehabilitation Center. The dental service rendered 81 patients included roentgenograms, prophylaxis, 262 restorations, endodontic treatment, 100 extractions, and education in oral hygiene. Acrylic mouthpieces designed to hold brushes, pencils and other articles were constructed for some patients.

After the establishment of the Vanderbilt University Poliomyelitis Respiratory and Rehabilitation Center in 1952, it became apparent that, if the total needs of severely involved patients were to be met, a dental service should be provided. It seemed that this service was a logical addition to the medical, surgical and allied services which had been instituted previously.

The need for such a program can be appreciated by a cursory examination of almost every patient admitted to the poliomyelitis unit. It is obvious that the prevention or correction of oral defects is at least as important in these patients as in any individual. Oral diseases and malocclusions may be particularly difficult problems for severely paralyzed patients. Also, the relative unavailability of dental care for many patients who are confined to the home after discharge from the Center makes it apparent that all possible dental therapy should be completed during hospitalization.

Accordingly, in September 1957 a dental service was instituted. This report outlines the scope of the services provided and lists three specific areas in which the recommendations of the attending dentist have been incorporated into the general care and rehabilitation of the patient.

SUMMARY OF SERVICE PROVIDED

Every patient admitted to the Respiratory Center between September 1, 1957, and June 1, 1959, who remained in the hospital for seven days or longer, was examined. Eighty-one patients were examined during this period and form the basis of this report. They made 405 visits, an average of five visits per patient. The maximum number of visits for any one patient was 19.

Not all patients received complete dental care. Seventeen of the patients were discharged prior to completion of the dental services considered necessary. An additional 14 patients needed orthodontic care, prosthetic devices or both, which could not be provided.

Table • Restorations

Surfaces involved	Number of patients	Total restorations
1	43	198*
2	23	48
3	6	13
4	3	3

*All restorations placed in the anterior teeth were recorded in this group.

One hundred and six dental bitewing roentgenograms were made of the teeth of 53 patients. In addition, 11 patients required periapical roentgenograms; 72 roentgenograms for detailed study of one or several teeth were made for these patients.

Routine dental prophylaxis, including polishing of restorations, and scaling and polishing of teeth, was carried out on 41 patients in 45 visits. Eighteen patients had heavy masses of calculus which required extensive scaling. Thirty-three visits were required to complete this work.

Two hundred and sixty-two restorations were inserted for 75 patients. The table shows that approximately three fourths of the restorations involved one surface of the tooth. The largest number of restorations done on any patient was 20. The number of surfaces involved in the restoration does not necessarily indicate the difficulty involved in effecting the restoration.

Treatment of teeth which had infected pulps was carried out on 13 patients. Six of these patients each had two teeth receiving pulp treatment. It was impossible to find any relationship between the infected pulp as a predisposing factor and the clinical onset of the acute stage of poliomyelitis in any of these patients. Infected pulp as a portal of entry for the virus causing poliomyelitis has been both affirmed[1] and denied.[2]

One hundred teeth were extracted from 31 patients. The operations varied from the removal of an exfoliating deciduous tooth to the surgical removal of impacted third molars. One patient required the removal of eight teeth. This was the greatest number of teeth removed from any one patient. The indications for extraction of a tooth for these patients were identical to the indications applied to other patients. Most of the teeth were extracted because of far-advanced decay, infection or both.

Many of the patients at the Center posed problems for the dentist which necessitated some alterations in the usual dental technics. Some of the patients cannot do without the use of the respirator to aid their breathing for long periods of time. Others have difficulty in controlling their secretions or in holding their mouth in a position to effect easy instrumentation while the dental procedures are being carried out. The emotional distress associated with dental care, superimposed on the usual psychological adjustments which the severely involved patients must make, has been a determining factor in the extent and speed with which the treatments could be carried out.

Close cooperation between the dentist, the house staff and the nursing staff has been of primary importance in making the work possible.

ORAL HYGIENE AND EDUCATION

Good oral hygiene is almost universally accepted as the cornerstone of good dental health. Accordingly, we have made efforts to institute oral hygiene care at the Center. We also try to perpetuate this care after the patient is discharged.

Each patient who can care for his own teeth is instructed in the essentials of good brushing technic either at his initial examination or at a subsequent visit. Emphasis has been placed on adequate training for the person who will care for the severely paralyzed patient at home so the practices instituted at the Center

will be continued after discharge. In addition, the attending dentist holds oral hygiene classes for the nursing service personnel. It is felt that they are in a better position to aid the patient after learning the principles and technics of good oral hygiene.

Standard recommended toothbrushes for adults and children have been provided for the patients.

SPECIAL MOUTHPIECES

An unforeseen contribution to the total care of the patient has been the construction of individual acrylic mouthpieces with appropriate attachments. Many of the severely handicapped patients accomplish remarkable tasks with the aid of brushes, pencils and other articles held in the mouth. A properly built well-fitted mouthpiece adapted for this use not only makes holding the article in the mouth less tiresome but also stabilizes the teeth and jaws and eliminates forces which are harmful to these structures.[3]

The illustration shows a mouthpiece in use. It is evident that a wide variety of tasks can be performed with it. The mouthpiece can be built so a respirator can be attached to assist ventilation. The mouthpieces are made by the attending dentist. New ones are made to accompany normal development as a child grows, or for replacement as the mouthpiece loses its fit through wear or damage.

The mouthpiece in use. The hose delivers positive pressure through the mouthpiece to the patient

DIET

Calcium and carbohydrate ingestion in the diet of the severely involved poliomyelitis patient is an area of overlapping interest of the physician and the dentist.

It has been the policy of the Vanderbilt Center to reduce the calcium intake of the severely involved patients. It is a known fact that any immobilized person will excrete calcium from the bones of the immobilized part in large quantities proportional to his degree of immobilization.

There is now no clear evidence to show whether or not these severely involved patients are more susceptible or more resistant to dental caries than a control group of patients with normal calcium metabolism. In the light of the lack of knowledge on this point, we have made no changes in the calcium intake allowed.

It is believed that, in spite of a large calcium output, a patient will be less likely to form stones in the urinary tract if the urine remains dilute. For this reason we have consistently encouraged large fluid intakes. In an effort to ensure good fluid intake, we formerly employed juices and carbonated drinks with a high simple carbohydrate content and a low pH. These two factors are widely held to be important in cariogenesis.[4] For this reason we now have largely eliminated these liquids from the diet and, insofar as possible, have substituted liquids with sugar substitutes. It is hoped that this change will contribute to the elimination of caries in the patients hos-

pitalized for long periods of time and subsequently confined to their home.

COMMENT

It is apparent that unmet needs in the dental care of poliomyelitis patients remain. Dental prosthetic and orthodontic appliances where indicated would contribute significantly to the well-being of these patients. Also, a program of topical fluoride application where indicated is a logical extension of the efforts being made toward caries prevention. The figures in this paper show that a real need has been partially met. It is hoped that the dental service for patients with poliomyelitis can be expanded.

Bennie-Dillon Building

Aided by a grant from The National Foundation.

From the departments of surgery and pediatrics, School of Medicine, Vanderbilt University.

*Department of Pediatrics, School of Medicine, Vanderbilt University.

1. Aisenberg, M. S., and Grubb, T. C. Exposed pulps of teeth as the portal of entry of poliomyelitis virus. J.A.D.A. 32:555 May 1945.

2. McCauley, H. B., Likins, R. C., and Arnold, F. A. Relation between caries experience and poliomyelitis in Minneapolis school children (1946 epidemic). J.A.D.A. 38:735 June 1949.

3. Buckley, R. R., and Slominski, A. H. The acrylic mouthpiece. Am. J. Occup. Therapy 12:23 Jan.-Feb. 1958.

4. Massler, Maury. Caries control in pediatric practice. Pediat. Clin. North America 3:953 Nov. 1956.

White Sound • White noise is the electronic cloth from which is fabricated the white sound curtain. An oldtime electrical/electronic entity which is unique in itself, white noise when reproduced acoustically sounds somewhat like the combination of escaping steam and a blowtorch, all in one, and, like white light is characterized by a uniform energy distribution vs. frequency on a per cycle basis. . . . In a practical sense, it is derived either from an electronic or gaseous plasma in a partial vacuum, as existant in a diode in the one case or a gas tube in the other. The white noise is specifically tailored electronically to the exact and known characteristic of the auditory pathways, and is then called "white sound" in order to distinguish it semantically from white noise. Technically, white sound differs from white noise principally in the redistribution of its energy content vs. frequency (or tonal pitch). This is done in such a manner as to engage with uniform stimulation all or most of the auditory nerve fibers as they are distributed along the basilar membrane of the cochlea, and to avoid over-stimulation of any one group as compared with others, while generating the analgesia. *Emory Cook. White Sound Analgesia, April 26, 1960.*

Odontogenic synalgia and electroencephalograph-recorded muscle action potentials

Merle W. Ogle, D.D.S., Phoenixville, Pa.*

The concomitant presence of traumatogenic occlusion and pain in the region of the temporomandibular joint indicates odontogenic etiology. Cuspal interferences may result in complex reflex activity which leads to irritation of musculature and the accumulation of stresslike impulses. Cuspal interferences may result in damage to the supporting structures of the teeth, and ultimately in pain in the head, face or neck regions. Two case reports illustrate the condition.

Traumatogenic dental occlusion may produce changes not only in supporting structures of the teeth, but also in the temporomandibular joint and its related musculature.[1,2] In addition, occlusal interferences to which the masticatory apparatus cannot adapt[3] may disrupt physiologic balance of musculature and lead to the overloading disease, chronic headache.[4]

Working and balance side[5] interferences between lower and upper cusps of teeth inhibit freely moving excursions of the mandible. Contact of lower inclined planes against interfering upper planes activates proprioceptors.[6] These sensory nerve terminals, in periodontal ligaments (membranes) of stressed teeth, convert information[7,8] concerning position and pressure stress into impulses of a proprioceptive nature which intensify reflex activity within temporomandibular musculature. Complex reflex activity may result in the irritation of musculature with development and accumulation of stresslike impulses. The delicately balanced harmony of correlated muscle action[9] may be disrupted by mechanical derangements[10] with development of chronic uncoordinated hyperactivity and pain symptoms.

Individuals with this neuromyalgic type "headache" comprise a typical group with unique characteristics. The pain or discomfort is generally unilateral and chronic without spontaneous remission of symptoms. The symptoms are usually vaguely described as a dull ache or "heavy feeling" in the temporomandibular region. Diffuse pain may radiate from joint or face muscle origins and involve the temporal and posterior orbit region, the face region and less frequently, the cervical region. Nociception[11] or soreness of temporal or other muscles may be present and may be detected by palpation. Joint clicking or soreness may or may not be present.

This problem of headache and associated myalgic symptoms was investigated during a three and a half year period by kinetic muscle studies of 36 patients

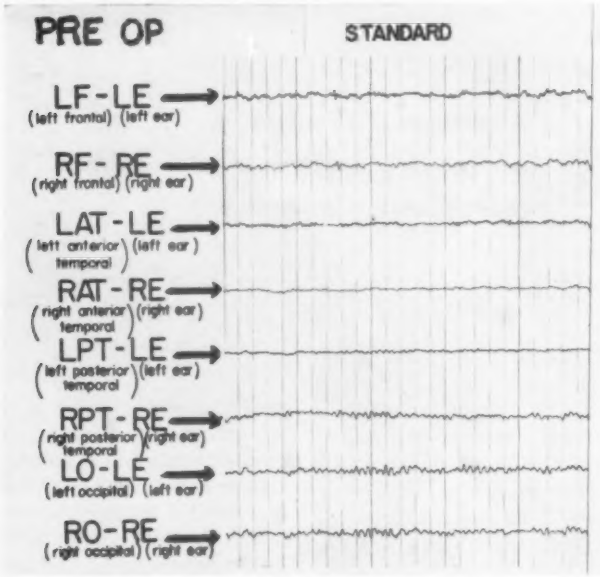


Fig. 1 • Brain wave registration

who claimed symptomatic relief after equilibration of occlusion. Myokinetic and myotonic studies were made using an electroencephalograph to record muscle potentials and relate muscle hyperactivity to centric and eccentric interceptive contacts in dental occlusion.

METHOD

In order to minimize artifacts, such as waving base lines, during jaw and muscle activity, electrodes were placed only in selected scalp areas.

Muscle action potentials were recorded on an eight channel Grass electroencephalograph machine using a 50 microvolt amplification standard. Needle electrodes were inserted bilaterally into the scalp in the frontal, anterior temporal, posterior temporal, and occipital regions. Electrodes or leads were placed in left and right ear lobes to act as neutral leads and complete the arrangement for monopolar or scalp to ear recordings. Each study utilized the standard electroencephalogram hook up with leads positioned in low amplitude areas of brain waves.

Before the kinetic muscle study was begun, a brain wave registration was obtained as shown in Figure 1. In this resting state, muscle tension of a symptom area was frequently recorded on a corresponding graph base line. This prekinetic record was called the standard.

Kinetic studies were made, before and after equilibration, during movements of the mandible. Teeth were in constant contact along eccentric excursion pathways on which the masticatory stroke terminates. Graph registrations were made during continuous mandibular movement (from centric to eccentric to centric) without crossing the midline. Pertinent excursions recorded were left lateral, right lateral and protrusive. Another eccentric excursion study pertained to bruxism (Fig. 2) in which movement of

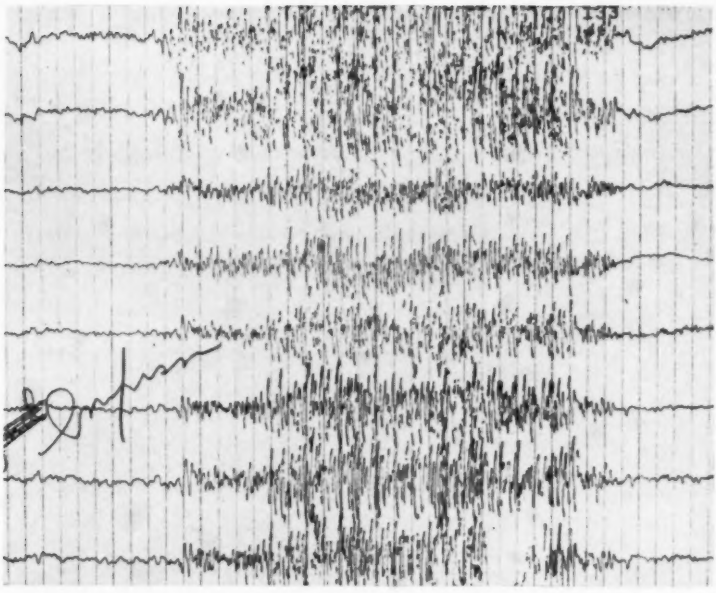


Fig. 2 • Bruxism across the midline activates left and right musculature simultaneously

teeth back and forth across the midline activated both left and right sets of masticatory muscles.

Clenching of teeth (Fig. 3), deliberate or during deglutition, registered with similar recordings as in bruxism, with the simultaneous activation of both the left and the right sets of masticatory muscles.

Proprioceptive muscle activity in all studies was registered as increase in frequency and amplitude on graph base lines. Left and right base lines of the four scalp areas, frontal, anterior temporal, posterior temporal and occipital, were compared for differences in frequency and amplitude. Base line recordings of nonsymptom sides were used as controls and for comparison.

The time interval or paper speed for all graphs is 30 mm. per second, represented by 5 vertical lines for each second. Accordingly, the typical registration of bruxism in Figure 2 required approximately 4 seconds of recording time.

DISCUSSION AND COMMENT

The scalp and periosteum are sensitive to the usual forms of thermal, chemical, mechanical and electrical stimuli.[12] Electrodes in the four selected scalp areas were instrumental not only in recording brain waves (Fig. 1) but in recording potentials of muscle motor units. Cortical electrical activity is altered by muscular electrical activity. Muscle potentials are stronger and presumably superimposed and recorded over the brain registrations. The change in muscle action potential was expressed in terms of increase in frequency and amplitude of stylus deflections during excursions or other activity of the mandible. Increase in frequency appeared to be associated with isotonic muscle activity such as in protrusive or

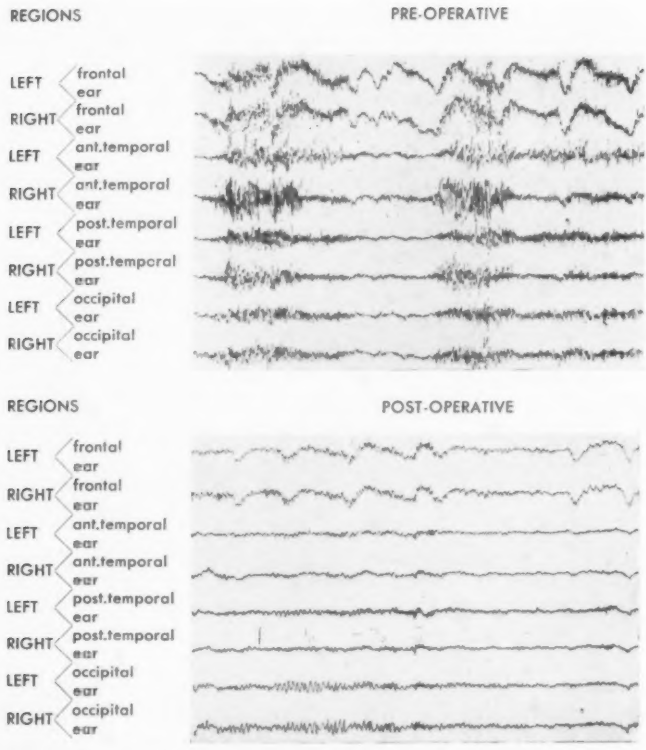


Fig. 3 • Before and after adjustment of centric interferences. Before adjustment, the interferences initiated muscle hyperactivity during clenching or swallowing

other nonleverage movements. Increase in amplitude appeared to be associated with leverage producing or isometric muscle activity and activation of periodontal proprioceptors.

Patient 1 • A 22 year old white man had right temporal, cheek and joint pain for about seven months. All 32 teeth had erupted and were present. Cuspal interferences included the lingual cusp of the upper left second molar during mesial excursion and right cuspid interference during right lateral mandibular excursion. Left lateral excursion was free from interference on the balance and working sides, and Figure 4 shows only increase in frequency on the corresponding (third) base line. Graphs were made before and after equilibration.

In Figure 5 during continuous right excursion, amplitude increase is noted when interference is encountered on the balance side as indicated on the first, third and fifth base lines. Also in Figure 5, increase in amplitude is noted on the right anterior (fourth) and right posterior (sixth) base lines when interference is encountered during right lateral excursions. Patient 1 claimed partial symptomatic relief after equilibration and complete relief five days later. The postoperative graph, Figure 6, shows no amplitude increase on the base line

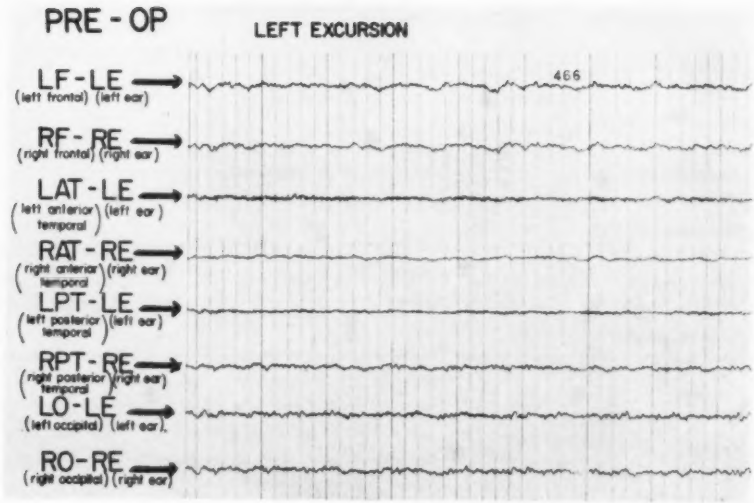


Fig. 4 • Nonsymptom side

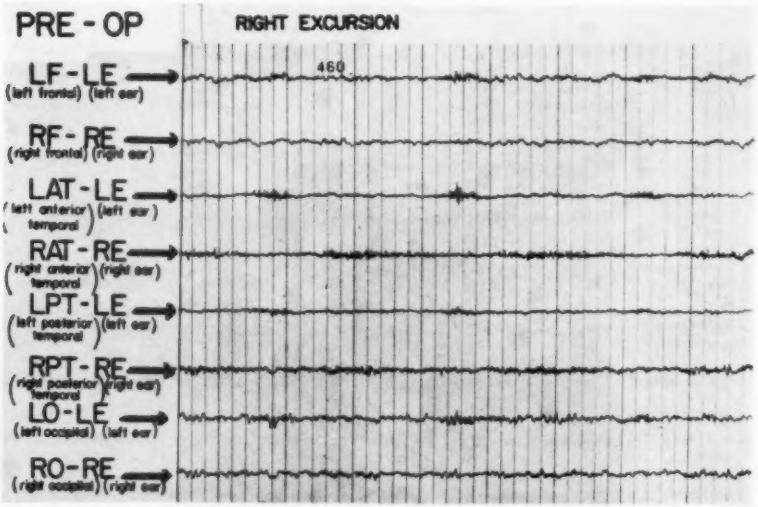


Fig. 5 • Symptom side. Left base lines indicate balance side distraction. Right base lines indicate working side interference

(third) which corresponds to the left balance side during right excursion. The right side base lines, fourth and sixth, also indicate a lessening of muscular hyperactivity during right excursion as evidenced by the lack of amplitude registration. The left excursion postoperative graph is not shown, since no left excur-

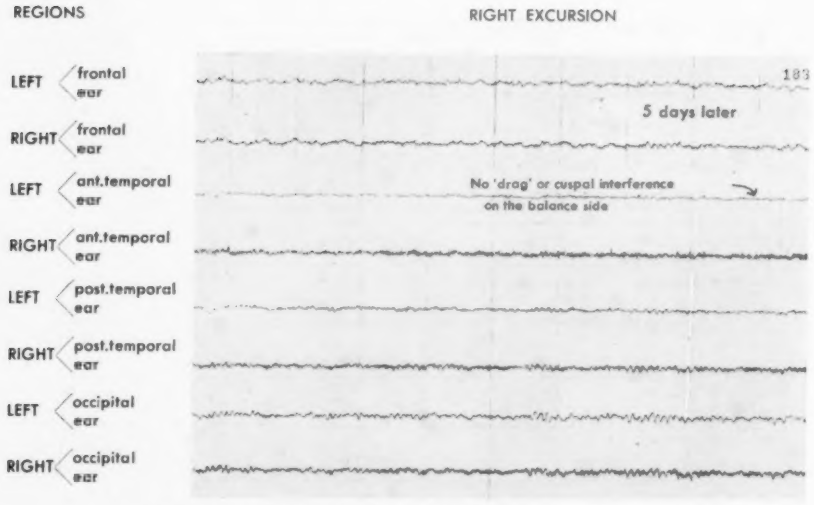


Fig. 6 • Reduction of amplitude is consistent with symptomatic relief

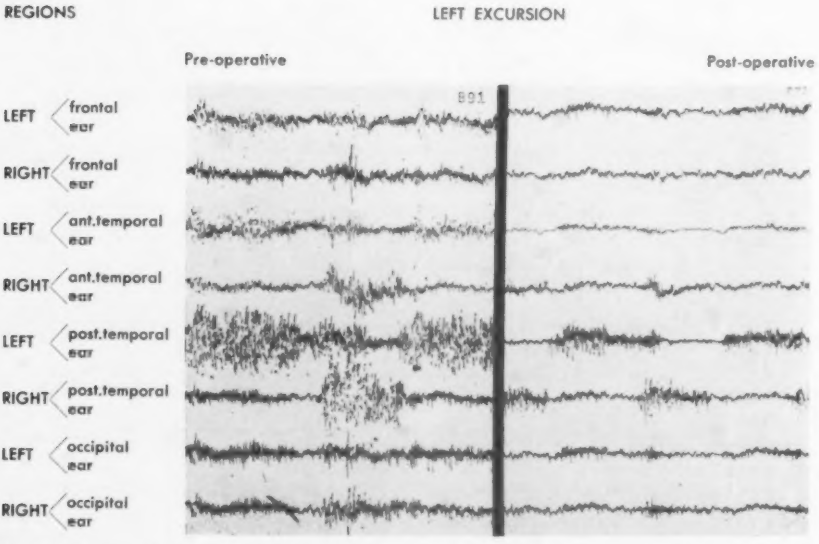


Fig. 7 • A characteristic of equilibration is reduction of complex reflex activity within musculature

sion adjustment was made and graph registrations remained unchanged.

Patient 2 • A 46 year old white woman had "dull ache" or pain of two years' duration of the left cheek muscles with occasional tenderness of the left joint. Cuspal interferences associated with left excursion were in the left cuspid and lingual cusp of the upper right second molar. Teeth were all present and erupted except for the upper and lower third molars.

The musculature of the patient was unusually heavy, which accounted for extreme amplitude noted in Figure 7. Preoperative muscle hyperactivity of the left or symptom side is indicated by increase of amplitude noted on the left posterior temporal (fifth) base line during continuous left excursion. Interference of the upper right second molar during left lateral excursion is indicated by abrupt increase in amplitude on the right posterior temporal (sixth) base line. Post-equilibration amplitude decrease is consistent with the relief claimed by patient 2.

SUMMARY

The concomitant presence of traumatogenic occlusion and joint or temporomandibular region pain syndromes indicates odontogenic etiology. A characteristic of occlusal equilibration is a lessening of complex reflex activity within musculature and a lessening of frequency and amplitude in myograms recorded by the electroencephalograph machine.

The site at which pain is felt may be remote from the primary source of impulses.[13, 14] Impulses may emanate from proprioceptors of supporting structures of teeth with interfering cusps. Such impulses, although normally subliminal, may contribute to muscle hyperactivity with resultant unrelieved fatigue and myalgic symptoms.

Cuspal interferences constitute not only a potential for damage to supporting structures of teeth but may ultimately bring about pain or other symptoms in head, face or neck regions.

228 Anderson Avenue

*Colonel, Dental Corps, U. S. Army. Valley Forge General Hospital.

1. Ingle, J. I. Determination of occlusal discrepancies. J.A.D.A. 54:6 Jan. 1957.

2. Jankelson, Bernard. Physiology of human dental occlusion. J.A.D.A. 50:664 June 1955.

3. Chasens, A. I. Occlusal disharmony and temporomandibular joint disturbances as a source of pain. J. D. Med. 12:107 July 1957.

4. Berlin, R.; Dessner, L., and Aaberg, S. Chronic headache and dysfunction of the temporomandibular joint. Acta med. scandinav. 154:167, 1956.

5. Ogle, M. W. Traumatic occlusion and mandible repositioning. J.A.D.A. 48:527 May 1954.

6. Fulton, J. F. Physiology of the nervous system, ed. 3. New York, Oxford Univ. Press, 1949.

7. Grundfest, H.; Nachmansohn, D., and Rothenberg, M. A. Effect of di-isopropyl fluorphosphate (DFP) on action potential and cholinesterase of nerve. J. Neurophysiol. 10:155 March 1947.

8. Chusid, J. G., and McDonald, J. J. Correlative neuroanatomy and functional neurology, ed. 9. Los Altos, Calif., Lange Medical Publications, 1958, p. 5, 6.

9. Perry, H. T., and Harris, S. C. Role of the neuromuscular system in functional activity of the mandible. J.A.D.A. 48:665 June 1954.

10. Staton, Y. A. Psychosomatic aspects of the temporomandibular joint syndrome. A.M.A. Arch. Otolaryng. 62:370 Oct. 1955.

11. Lewis, Sir Thomas. Pain. New York, Macmillan Co., 1942, p. 68-98.

12. Moench, L. G. Headache, ed. 2. Chicago, Year Book Publishers, Inc., 1951.

13. Wolff, H. G. Nature and causation of headache. J. D. Med. 14:3 Jan. 1959.

14. Tunis, M. M., and Wolff, H. G. Studies on headache. A.M.A. Arch. Neurol. & Psychiat. 71:425 April 1954.

Personality characteristics in patients with temporomandibular joint symptoms

Clarence M. McCall, Jr., D.M.D., M.S., U. S. Air Force; Lucian Szmyd,* D.M.D., M.S., Brooks Air Force Base, Texas, and Richard M. Ritter,† M.A., Austin, Texas*

A standard personality inventory was used to compare certain characteristics of 70 patients with temporomandibular joint disturbances to those of 70 subjects who required no dental treatment and 70 patients about to undergo oral surgery. The patients in the experimental group responded to 48 items in a predictable manner which deviated from the response of a matched, normative group. It is not now possible to determine whether specific personality characteristics are causative factors of temporomandibular joint disturbances or stem from such disturbances. It may be possible to devise a test which will identify those persons with a characteristic "temporomandibular joint profile" and which will discriminate between somatic and behavioral types.

Personality evaluation is a valuable adjunct in the diagnosis and treatment of patients with temporomandibular joint disturbances. Moulton[1] suggests that dental therapy and prevention should take into consideration not only the patient's dental condition but his personality problems. Schwartz, Moulton and Goldensohn[2] stress the importance of the underlying psychologic and physiologic mechanisms in the management of pain involving the temporomandibular joint. They cite Moulton's[3] observation that anxiety is a most frequent underlying cause contributing to the development of the pain-dysfunction syndromes. Landa[4] emphasizes the role of psychogenic factors by including temporomandibular joint disturbances engendered by psychogenic causes in a formal etiologic classification. Henny[5] states that nervous tension syndromes have an important place in the production of temporomandibular joint pain. Schwartz[6] also contends that many temporomandibular joint patients present a pain-dysfunction syndrome that is of tensional origin. Granger[7] notes that psychogenic factors are always present in this type of patient. He points out that these factors should be understood in their proper perspective as they affect treatment results. Kydd[8] found that 76 per cent of the patients with temporomandibular joint disturbances in his study were emotionally disturbed to a significant degree.

Although it is generally agreed that psychosomatic factors are important in the diagnosis and treatment of temporomandibular joint disturbances, there is little definitive information available to the clinician. A determination of how the

patient with temporomandibular joint problems differs from the general population will facilitate clinical appraisal.

The purpose of this study is to identify some of the distinguishing personality characteristics of the patient with temporomandibular joint disturbances.

METHOD

The experimental subjects in this investigation were 70 male and female patients who complained of temporomandibular joint pain. All patients were in, or associated with, the military establishment. The subjects were matched as to age, sex, marital status, and military rank or occupation, with 70 patients who required no dental treatment. A third group consisted of 70 patients about to undergo oral surgery. The oral surgery consisted of the removal of an impacted mandibular third molar. This group was included in the study to evaluate the role of acute anxiety in the temporomandibular joint syndrome. It was assumed that similar responses by the temporomandibular joint and presurgery groups would indicate, if these responses differed from those of control subjects, that immediate high-level anxiety plays a major role in temporomandibular joint problems.

Each subject in this study was administered the group form of the Minnesota Multiphasic Personality Inventory (MMPI) immediately prior to examination or treatment.[9] In the present study the 566 items of the inventory were employed in the form of a structured interview. An item analysis of the questions on the inventory was performed without any reference to the clinical scales on which each item fell using the chi-square test of significance. On the assumption that temporomandibular joint disease has a psychosomatic basis, the general prediction was made that the responses of temporomandibular joint patients would differ from those of the control subjects. For most items this prediction was simple and unambiguous. Where there was any doubt, the deviant direction on the scale or scales to which the item belonged was predicted.

FINDINGS AND DISCUSSION

The 566 items of the inventory were analyzed separately for response differences between groups. It was believed that interpretable information could not be obtained from existing scales. It could not be assumed that item responses were determined by personality factors underlying the temporomandibular joint syndrome, rather than by conditions associated with, or resulting from the syndrome. For example, a positive response to an item on the Hysteria Scale of this inventory such as "I find it hard to keep my mind on a task or job" might reflect a tendency to hysteria or might indicate only that pain from any cause interferes with efforts to concentrate on a task or job.

By use of the chi-square test it was found that 48 items discriminated between the temporomandibular joint group and the control group at or beyond the .05 significance level. On the basis of overt content, these 48 items were separated into three groups:

1. Somatic—items primarily of a physical nature.
2. Behavioral—items primarily of an affective or attitudinal nature.
3. Miscellaneous—items which did not clearly fit either of the foregoing categories.

It is convenient and statistically meaningful to categorize items and to predict response direction intuitively. The eventual verification of such psychologic factors which may underlie the temporomandibular joint syndrome must, however, rely upon the verification of empirically derived predictions. The findings which follow might serve as a basis for predictions of this sort. An asterisk indi-

cates items which also discriminated between the presurgery and control groups.

Twenty-two items were placed in the somatic category. Thirteen of these concern complaints involving the head, neck, and throat, or the gastrointestinal tract. These items are as follows:

There seems to be a lump in my throat much of the time. (True)

I am troubled by attacks of nausea and vomiting. (True)

Much of the time my head seems to hurt all over. (True)

I am not bothered by a great deal of belching of gas from my stomach. (False)

I am very seldom troubled by constipation. (False)*

I have very few headaches. (False)

I am bothered by acid stomach several times a week. (True)

I hardly ever feel pain in the back of my neck. (False)

I am troubled by discomfort in the pit of my stomach every few days or oftener. (True)

There seems to be a fullness in my head or nose most of the time. (True)

I have a great deal of stomach trouble. (True)

I do not often notice my ears ringing or buzzing. (False)

I have no trouble swallowing. (False)

On these items as on all of the somatic items, the temporomandibular joint patients responded in the aberrant direction more often than control subjects. Of the remaining nine items of a more general nature, several suggested emotional involvement. These items are as follows:

I frequently notice my hand shakes when I try to do something. (True)

Parts of my body often have feelings like burning, tingling, crawling, or like going to sleep. (True)*

I have little or no trouble with my muscles twitching or jumping. (False)

I hardly ever notice my heart pounding and I am seldom short of breath. (False)

I have numbness in one or more regions of my skin. (True)

I am in just as good physical health as most of my friends. (False)

During the past few years I have been well most of the time. (False)

I have never felt better in my life than I do now. (False)

I have few or no pains. (False)

Because of the relatively vague content of the 20 behavioral items, it was not possible to subcategorize them. Also, this category included one item ("I get mad easily and get over it soon") to which temporomandibular joint patients responded in the opposite of the predicted direction (False), based on the Hysteria Scale key. It is the only one of the 48 significant items to which these patients responded in the opposite of the predicted direction. The remaining 19 behavioral items most applicable to a hypothesis of temporomandibular joint psychogenesis are as follows:

My hardest battles are with myself. (True)

I frequently find myself worrying about something. (True)*

At times I find I can make up my mind with unusually great ease. (False)

I feel anxiety about something or someone almost all the time. (True)

I have certainly had more than my share of things to worry about. (True)

I have been afraid of things or people that I knew could not hurt me. (True)

I like to keep people guessing what I'm going to do next. (True)*

I have often felt guilty because I have pretended to feel more sorry about something than I really was. (True)*

I sometimes feel that I am about to go to pieces. (True)

I have periods of such great restlessness that I cannot sit long in a chair. (True)

I believe I am no more nervous than most others. (False)

I worry over money and business. (True)

I am not easily angered. (False)

I am usually calm and not easily upset. (False)

I do not dread seeing a doctor about a sickness or injury. (False)

Except by a doctor's orders I never take drugs or sleeping powders. (True)

When I am cornered I tell that portion of the truth which is not likely to hurt me. (False)

I have never seen things doubled (that is, an object never looks like two objects to me without my being able to make it look like one object). (False)

I must admit that I have at times been worried beyond reason over something that really did not matter. (True)

The miscellaneous category contained only six items. In each instance, however, the responses of temporomandibular joint patients were in the direction that could be hypothesized on the basis either of general discomfort or the keying of the item for the scale to which it is assigned. They are as follows:

I am about as able to work as I ever was. (False)

I feel I have often been punished without cause. (True)

I find it hard to keep my mind on a task or job. (True)*

I believe women ought to have as much sexual freedom as men. (False)

I like to study and read about things that I am working at. (False)

At times I have worn myself out by undertaking too much. (True)

In an analysis of item differences between the 70 presurgery patients and the control group, a total of 18 items discriminated between the groups at or beyond the .05 significance level. It should be pointed out that only six of these 18 items were also responded to significantly in the same direction by the temporomandibular joint patients. With respect to an acute situational anxiety factor in the temporomandibular joint entity, this evidence was regarded as inconclusive.

Some cautions need to be noted in evaluating the results of this study. First, and most important, in an analysis of differences in group responses to 566 items, the probability of obtaining some differences purely by chance cannot be overlooked. Although 47 of the 48 items which significantly discriminated temporomandibular joint patients from normal controls did so in the expected direction, further evidence is necessary before it can be concluded that specific item responses reflect unique personality characteristics of the temporomandibular joint patients. Furthermore, group comparisons must be made to permit generalization beyond the age, sex and occupational characteristics of the present samples. Also to be emphasized is the limitation on any interpretation of the findings of this study with respect to the etiology of the temporomandibular joint syndrome. It is not now possible to determine whether specific personality characteristics are causative factors or stem from the temporomandibular joint disorder. Although the content of discriminating items may suggest causative factors, the present study demonstrates only that this content is responded to differently by the temporomandibular joint patients than by the control subjects.

SUMMARY

This study utilized a standard personality inventory to compare certain characteristics of 70 patients with temporomandibular joint problems with those of 70 control subjects selected from among routine dental examinees to match the experimental group on age, sex, marital status and military rank or occupation. A third group of patients who were about to undergo oral surgery was included to evaluate the role of immediate situational anxiety in the temporomandibular joint syndrome.

An analysis of response differences on each of the 566 items in the inventory yielded 48 items which discriminated between the temporomandibular joint and control groups at or beyond the .05 significance level. The temporomandibular joint patients responded in the predicted, aberrant direction with respect to the control group on 47 of these 48 items. The content of 20 of these items was judged to be primarily behavioral in nature and, for the most part, not clearly identifiable with temporomandibular joint symptomatology. Eighteen items significantly discriminated between the presurgery and control groups. The finding that only six items similarly distinguished both the temporomandibular joint and presurgery groups from the control group precluded an interpretation which would implicate acute situational anxiety, as defined by the conditions of this study, as a principal factor mediating the responses of the temporomandibular joint patients. This does not exclude chronic internalized anxiety as a possible psychogenic factor in temporomandibular joint patients.

CONCLUSIONS

The findings of this investigation permit two general conclusions. First, it appears that patients who manifested disturbances of the temporomandibular joint responded to items of a standard personality inventory in a predictable manner, which deviated from the manner of responding of a matched, normative group. The principal implication of this finding is that it may be possible to devise a paper and pencil instrument which will not only identify those persons with a characteristic "temporomandibular joint profile" but which will discriminate between somatic and behavioral types. Second, the finding of a subgroup of items, most of which distinguished temporomandibular joint patients on the basis of behavioral content that cannot readily be interpreted as a simple pain or discomfort response, suggests that this content may, in fact, reflect yet undefined personality characteristics underlying the temporomandibular joint syndrome.

Box 78, 6332 U. S. Army
Dispensary, APO 239, San Francisco

The opinions or assertions contained herein are those of the authors and are not to be construed as official or as reflecting the view of the Department of the Air Force or the Air Service at large.

From department of dental sciences, School of Aviation Medicine, USAF Aerospace Medical Center (ATC), Brooks Air Force Base, Texas.

*Major, U. S. Air Force (Dental Corps).

†University of Texas.

1. Moulton, Ruth E. Oral and dental manifestations of anxiety. Psychiatry 18:261 Aug. 1955.

2. Schwartz, Laszlo; Moulton, Ruth E., and Goldensohn, Eli E. Pain involving the temporomandibular articulation. In Dental Clinics of North America, July 1959, p. 515.

3. Moulton, Ruth E. Psychiatric considerations in maxillofacial pain. J.A.D.A. 51:408 Oct. 1955.

4. Landa, J. S. The dynamics of psychosomatic dentistry. Brooklyn, Dental Items of Interest Pub. Co., 1953, p. 251.

5. Henny, Fred A. The role of nervous tension in the painful temporomandibular joint. J. Oral Surg. 14:169 April 1956.

6. Schwartz, Laszlo. Dental and facial pain. J.A.D.A. 51:393 Oct. 1955.

7. Granger, Ernest R. Occlusion in temporomandibular joint pain. J.A.D.A. 56:659 May 1958.

8. Kydd, William L. Psychosomatic aspects of temporomandibular joint dysfunction. J.A.D.A. 59:31 July 1959.

9. McKinley, J. C., and Hathaway, S. R. The identification and measurement of the psychoneuroses in medical practice: The Minnesota Multiphasic Personality Inventory. J.A.M.A. 122:161 May 15, 1943.

Criticism • Criticism is used to speaking in a voice of finality, for only by speaking so may it attract the attention that is necessary to its very life. ***George Jean Nathan, Testament of a Critic.***

Miniature wax sculpturing: a thirty-year experiment

William P. Harrison, D.D.S., Hollywood, Calif.

In 1929 the University of Southern California School of Dentistry began an experimental project of wax figure carving for freshmen students. The project is still being carried on. A comparison of grade records over the past 30 years with the original evaluations of the carvings shows that accurate prediction of outstanding students, misfits and under average students has averaged about 90 per cent correct. The chalk carving aptitude testing program adopted in the early 1950's by the American Dental Association has largely eliminated the misfits who might otherwise have spent needless time and money in attempting the study of dentistry.

An important and significant question arises when a young man decides upon the profession of dentistry as his life's career; namely, can he be assured that he is adapted to this particular field of endeavor? Before the advent of the national aptitude test in the early fifties, little consideration was given to that question. Two years of predental education in the required basic sciences were accepted as sufficient evidence of the necessary qualifications for entering the study of dentistry. A qualified student, on admission to a dental school, expected to complete the prescribed course of study in another four years.

Statistics had shown, that, after six months or a year's training in dental school, a number of seemingly qualified students were incapable of orienting themselves to necessary technical subjects requiring digital skill, although their work had shown unquestionable evidence of conscientious effort and application. Other students with the same predental qualifications had shown satisfactory progress, and some had excelled in their work with no evidence of expended effort.

These observations and an emergency situation, associated with student work, were the incentives for undertaking an experimental project to investigate the variations of technical ability, and to determine whether a natural or acquired aptitude for dentistry is possessed by some and is innately lacking in others.

THE CARVING PROJECT

In September of 1928, the freshman course in dental anatomy at the University of Southern California School of Dentistry started a week earlier than previously announced. Books and instru-

ments had not yet been issued, but wax cylinders and pocketknives were available. As a result of this situation several laboratory periods were scheduled in advance of the usual lecture hours customarily devoted to preliminary instruction in nomenclature and tooth carving. In order to utilize this extra laboratory time, and as an emergency measure to keep the class occupied, it was decided that each student should carve an original figure in wax for his first laboratory project. Upon completion, the carvings were filed as extracurricular work, with no thought of any future value. However, at the end of the year, when grade reports of each student were being reviewed, a casual observation of these carvings revealed the interesting fact that the inferior carvings had been made by students who had failed or had received poor grades, whereas the better carvings had been made by students who had excelled in the year's work.

This discovery led to an interest in investigating the merits of creative wax carvings as a suitable aptitude test for dentistry.

OBJECTIVE PLANS OF THE PROJECT (1929)

As an experimental project, wax figure carving would be included in the freshman program of future classes. Each carving would be evaluated at the end of four two-hour periods but the grades would not be considered as part of the regular curricular work. Neither would the results of these tests be considered as conclusive evidence of aptitude until four years had elapsed, or upon the student's graduation when completed records of all dental and predental grades would be available for comparative analysis.

The project offered many promising possibilities if the experimental tests could be carried out over a period of 15 or more years. All models, carving ratings and scholastic ratings would be preserved for future reference.

The 15 year period was extended to 25 years when a final report was compiled. At this writing (1960) the work is still being carried on. To date over 3,000 miniatures have been preserved.

Description of the Test • Each student is supplied with several cylindrical pieces of cream colored wax (1 inch by ¾ inch) of hard composition (carnauba 60 per cent and paraffin 40 per cent) which cannot be molded or fused. A pocketknife and several wax carving instruments are also supplied.

During the first period of the test the students are permitted to view the collection of carvings of previous classes. As they inspect these carvings they are told that since originality is one of the qualifications of the test, the carvings are shown not as models but rather as examples of what other classes had accomplished.

It is suggested that a former occupation, hobby or some special interest, thought or experience serve as an inspiration for the carvings, but anything pertaining to dentistry, such as a tooth, should not be attempted. It is stressed that no copy models are to be used. The carving must be created from a mental pattern. The size of the finished carving is limited to the dimensions of the wax cylinder.

On completion, the carvings as a group are viewed for comparison and evaluation. At no time are these results used as reference for future grading or to influence future grading.

Methods of Grading • The evaluation of carvings of the creative type requires a radically different approach than the grading of types of carvings where models are used or when specifications and measurements are supplied. Originality, type of selection requiring greater carving skill, appreciation of symmetry, neatness

Fig. 1 • Dr. Harrison stands beside a case containing some of the miniature carvings made by his dental students over the past 30 years. These are only a small portion of the over 3,000 miniatures in his collection

and finish, are all attributes taken into consideration when evaluating each carving.

Types of Carvings • The incentives governing the many selections were influenced by such interests as mechanics, sports, the prohibition period, the war period, historical interest and various current events.

Individual examples of the carvings are: a Trojan warrior, a Danish windmill, two workable gears, a figure of Mahatma Ghandi, bust of a student's father, an elaborate commode, a railroad coach, a wishing well, and a T-bone steak (1943). Various humorous and abstract carvings are worthy of psychological study.

RESULTS OF THE PROJECT

A preliminary report of the experiment was presented at the Chicago meeting of the American Association of Dental Schools in 1929, and was included in a published article in 1930.[1] Also, a description of the aptitude test was published in 1934.[2] A group of selected carvings was first shown as an exhibit at the American Dental Association meeting in St. Louis in 1938.

A comparison of grade records over the past 30 years with the original evaluations of the carvings is enlightening. Accurate prediction of outstanding students, misfits and under average students has averaged about 90 per cent correct.

In some instances, students with low prediction ratings had records of high grade averages in theoretical subjects. By concentrated effort, a few of these developed the necessary technical skill to graduate, but none received clinical or technical honors.

There have been few failures among those who had received good prediction ratings in the carving tests.

With the knowledge that grading of the carvings would not be included as curricular work, why then these dramatic examples of conscientious effort and competitive enthusiasm?

A number of students have stated that the challenge, and subsequent meeting of that challenge, gave them an exalted

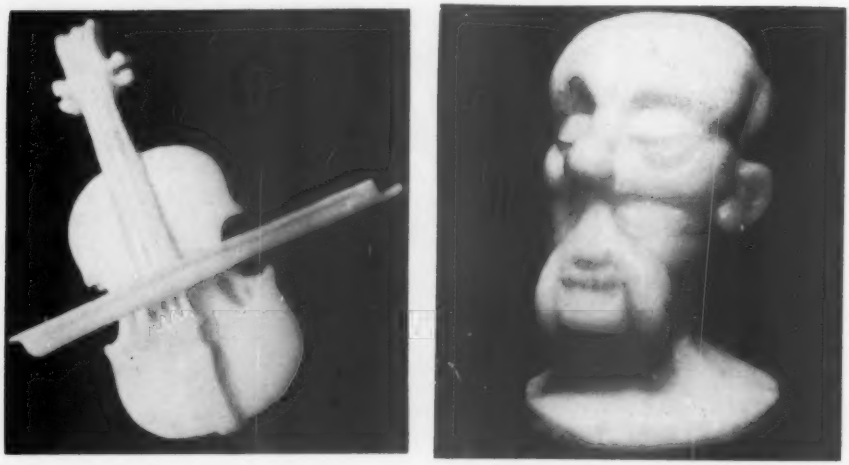


Fig. 2 • The precision and detail that go into the carvings are evident in these two sample miniature sculptures

feeling of self confidence and self satisfaction as payment for the work and perseverance expended in completing their individual projects.

A few were discouraged as a result of their efforts. These needed advice and encouragement. Their response has been considered to be satisfactory in most instances.

From a teaching standpoint, and aside from the experimental aspect of the project, the time devoted each year to the wax carvings has been profitably utilized in relation to the course in dental anatomy.

1. Preliminary lecture hours in orientation, nomenclature and tooth carving instruction are adequately provided.

2. The wax cylinders used in the carving experiment are identical in composition to those used in the laboratory procedure of carving teeth.

3. The same carving instruments are also used.

4. The technic of tooth carving requires the same perseverance, exactness and attention to detail as the carving of the miniature figure does.

CONCLUSIONS

1. There is no question of doubt, in the author's opinion, that a fair degree of natural or acquired aptitude in the coordinate use of the mind and the hands is an essential and even preferred requirement for admission to a dental school regardless of high grade point averages in theoretical subjects. This aptitude has been adequately demonstrated by the wax carving tests.

2. Predental curriculum should include several technical courses which would adequately train the student who aspires to dentistry. Mechanical drawing, ceramics, sculpturing and precision shop work would prove beneficial.

3. The wax carving aptitude test of the creative type is worthy of consideration in evaluating qualified applicants for admission to dental schools. Boldly stated, it could be used for evaluating and advising predental applicants.

4. Dentistry is fundamentally a biomechanical science. Theoretical knowledge and a scientific background are essential requirements of the profession,

but good dental service in actual practice requires a high degree of digital skill.

EPILOGUE

The original material for this paper was written in 1950. However, the material was put aside because of an interest in the national apitude test for admission to dental schools.

The aptitude test sponsored by the American Dental Association and adopted in the early fifties, has solved many of the problems of the admissions committees, especially in their selections from an unprecedented number of qualified predental applicants.

The manual dexterity portion of the test consists of the carving of geometrical cuts in two cylinders of chalk according to certain mathematical specifications.

The inception of the American Dental Association test presented an interesting challenge: What bearing would the results of the national test have upon the creative wax carving experiments?

Statistics of the past ten years have indicated a very low percentile in potential failure ratings. Accurate predictions of graduating honor students have been outstanding. Average ratings show superior types of wax carvings exhibiting greater skill and aptitude especially in relation to the intricacies of design and execution.

The aptitude testing program of the American Dental Association has largely eliminated the misfits who would have otherwise spent needless time and money in attempting to pursue the prescribed course of the dental curriculum. Of greater value is the elevation of dentistry to a higher standard.

6253 Hollywood Boulevard

*Professor, dental anatomy and gnatho dynamics, School of Dentistry, University of Southern California.

1. Harrison, W. P. Developing dental anatomy into a basic dental subject. J.A.D.A. 17:897 May 1930.

2. Ingenious tests help dental students acquire unusual skill. Popular Science Magazine 125:53 July 1934.

International Research • In Paris in mid-May, delegates from 33 nations (including the Soviet Union and the United States; Israel and the United Arab Republic) brought to conclusion a harmonious and highly successful meeting. Although there were minor differences, there was general agreement about the major problems to be attacked and about the importance of continued international cooperation. The meeting was held at UNESCO House, not at the Palais de Chaillot; the delegates were scientists, not heads of states; and the subject was the application of science to human welfare, not international politics. . . . From the tone of the conference there can be no doubt that cooperation among scientists of many disciplines and many countries will continue, to the detriment of none and to the ultimate gain of all. *Graham DuShane. Editorial. Science 131:1861 June 24, 1960.*

Exodontia for a patient with sickle cell anemia: report of case

Michael S. Matson, D.D.S., Miami, Fla.*

In patients with sickle cell anemia, exodontia and other oral surgery procedures present risks. Precautions necessary to prevent crisis include supervision of the patient by medical consultants, raising of the hemoglobin content of the blood by the transfusion of whole blood, regional rather than general anesthesia, hospitalization and close postoperative observation. A case report illustrates the treatment procedures.

Sickle cell anemia is a serious malady with a fatal prognosis, although some patients live on for many years. Extraction of teeth and other oral surgery procedures for patients suffering from this disease present definite risks. There are important factors which must be taken into consideration when planning oral surgery treatment.

In this form of anemia, death may occur from infections or as a result of thrombosis or hemorrhage involving vital tissues. This form of anemia is now recognized as a clinical entity and many case histories are on record. Usually it is found in Negroes. Instances of this type of anemia have been reported among Greeks, Italians, and Sicilians, as well as Negroes, but these instances are rare.

Sickle cell anemia is a hereditary and familial disease, present and recognizable in infancy. The disease appears in two forms, latent and active. The dentist concerns himself with the complications that may arise when the patient has the active form of the disease. This type is most severe in children. The red corpuscles are elongated and sickle shaped and the hemoglobin content is proportionately high. A moderate leukocytosis with a nearly normal differential count[1] is almost always present.

Individuals with this type of anemia show a remarkable adaptation to their state of chronic anemia and jaundice. They may have few or no complaints. Examination may reveal that the sclerae are greenish-yellow and the mucous membranes are very pale. The physical appearance of these patients often presents a characteristic picture. They are usually underweight, the trunk is short, the extremities are long, and the body is linear with narrow hips and shoulders.

Abnormalities in the roentgenographic appearance of the bones may be found, especially in the skull, vertebrae, tibia, and fibula. The earliest change visible in the skull is the development of a ground glass appearance. In more advanced stages a peculiar radial striation is seen.[2]

A complication which may arise when surgical procedures are performed is the development of crisis. This is manifest as shock. Crisis sometimes occurs in sickle

cell anemia when the oxygen content of the blood is lowered. The lowered oxygen tension deoxygenates hemoglobin causing it to crystallize which in turn distorts the erythrocyte cell membrane. The malformed cells collect in small blood vessels causing blockage which results in organic damage. The same process also causes a rapid removal of red cells from circulation.The result of this combined mechanism is shock and, in severe cases, death.

Prevention of crisis depends on careful supervision of the patient by the dentist, or oral surgeon, and the physician. Preoperative examination of the patient's blood may reveal a hemoglobin as low as 5 Gm. per 100 cc. of blood. If this is the case a transfusion of whole blood will be necessary to raise the hemoglobin content to a level which will permit the necessary surgical procedures to be undertaken safely.

The use of general anesthesia is contraindicated for these patients because a lowering of the oxygen tension of the blood may occur. This will result in a crisis with all the dangers inherent in this condition. Regional anesthesia should be relied upon.

Hospitalization is indicated for the patient with sickle cell anemia when treatment, such as extensive exodontia, is necessary. Despite all precautions, these patients may go into crisis during the operative or postoperative periods. Oxygen should be available for immediate administration. A supply of whole blood of the proper type should be available for transfusion.

The following case history illustrates the problems of clinical management encountered during the treatment of a 14 year old Negro boy with a history of sickle cell anemia.

REPORT OF CASE

The patient was referred to the oral surgery clinic of the hospital for multiple tooth extractions.

Complaint and Present Illness • He was conscious of sensitivity to thermal stimuli in several sections of his dentition. Clinical examination revealed that the mandibular first molars, the maxillary first molars, and a maxillary second bicuspid were unrestorable. Roentgenographic examination confirmed this diagnosis as regions of apical involvement were visible and decay involved the bifurcation of the molars.

Past History • The patient was a schoolboy in apparent good health. He had been admitted to the hospital several times for "stomach ache" which apparently had been sickle cell crisis. On these occasions he had received transfusions of whole blood. He apparently had not received adequate dental care and was negligent about oral hygiene.

Family History • The patient's mother had died of sickle cell anemia. His older brother, age 17 years, was suffering from the same disease. Two older sisters had died from this disease at the ages of 20 and 13 years. The father was alive and in apparent good health.

Physical Examination • The boy was poorly developed for his age. He was underweight, with a small and linear physique. He appeared to be mentally sluggish. On admittance to the hospital his blood pressure was 108/68, his oral temperature 99.2°F., his pulse 78, and his respiration 22.

Examination by the medical service revealed the presence of a sinus arrhythmia in the heart with "blowing systoles," that is, a functional murmur heard when the heart is in systolic function, over the apex. The liver and tonsils were enlarged.

Laboratory Data • Consultation with the hematological service was obtained. Complete laboratory examination of the blood and urine was ordered.

The results of the laboratory tests

were: red blood cells 2,690,000, hemoglobin 7.3, hematocrit 22.5, mean corpuscular volume 83.7, mean corpuscular hemoglobin volume 32.5, mean corpuscular hemoglobin 27.1, reticulocytes 10.5, icterus index 15, and white blood cell count 14,250.

The results were positive for the sickle cell test. The serological test for syphilis was negative. The urine was negative for sugar and albumin, the specific gravity was 1.010, and the color was clear and yellow. Cross match and typing was Rh positive, Group A.

Course and Treatment • As a result of consultation with the hematological, anesthesiology, and medical services, the following suggestions were made for the contemplated removal of the necessary teeth.

The hematology report said:

Patient with sickle cell anemia with no history of crisis during the past two years. The bleeding time is normal, the Rumpee Leede is negative and the prothrombin time is normal. No contraindications for dental extractions are present from the hematological viewpoint. Recommend transfusing with two units of whole blood prior to surgery.

The anesthesiology report said:

In light of the sickle cell anemia, it would be advisable to use some form of local or block anesthesia. A lowering of the oxygen content of the blood or loss of blood during surgery would certainly be better tolerated if the patient is not under general anesthesia.

The medicine service report said:

Reading of the chest film revealed a very slight decrease in the size of the heart. There is coarsening of the trabecular markings throughout the ribs consistent with sickle cell disease. The lungs are clear. The cardiac status of the patient presents no contraindications for the extraction of teeth with the use of local anesthetic agents.

Operative Procedures • Removal of the teeth was scheduled for three days after admission to the hospital. On the day prior to surgery a transfusion of one pint of blood was given. On the morning of surgery an additional 250 cc. of whole blood was transfused. The result of the test for the hemoglobin content of the blood showed a rise to 9.3 Gm. per 100 cc. of blood. One pint of blood was made available for use, if necessary, during surgery. Two hours before the operation the patient received 50 mg. of promethazine hydrochloride intramuscularly, and one hour later 75 mg. of meperidine hydrochloride intramuscularly.

The patient was brought to the operating room in a completely relaxed and sedated condition. A medical consultant was present. Oxygen with proper equipment for administration and the pint of whole blood ordered previously were on hand.

Injections of 2 per cent lidocaine were made into the mucous membrane of the four quadrants of the mouth. The condemned teeth were removed without difficulty. The patient remained quiet during the procedures. Clotting appeared to be normal. The patient was returned to the ward where instructions were given for the vital signs to be checked every ten minutes for four hours.

Result • The patient slept comfortably for 14 hours after surgery. There was a minimum of bleeding from the sockets. On the day after surgery the patient appeared to be comfortable and without pain. There was no facial swelling. He was alert and friendly. Three days after the extractions he was asymptomatic and was discharged from the hospital. He was instructed to seek dental treatment for the restoration of the decayed teeth in his dentition.

SUMMARY

The precautions necessary to prevent crisis during exodontic procedures on a patient with sickle cell anemia are discussed. These precautions included adequate supervision of the patient by medical consultants prior to surgery. The

hemoglobin content of the blood was raised by the transfusion of whole blood before the extraction of the teeth. Regional anesthesia after adequate premedication with promethazine hydrochloride and meperidine hydrochloride was used because general anesthesia was contraindicated. Additional whole blood for transfusing and oxygen with adequate equipment for administration were available for emergency treatment, if needed, during the operation.

7657 Biscayne Boulevard

*Former chief resident in oral surgery, department of dentistry, Kings County Hospital Center, Brooklyn.

1. Todd, James Campbell, and Sanford, Arthur Hawley. Clinical diagnosis by laboratory methods; a working manual of clinical pathology, ed. 9. Philadelphia, W. B. Saunders and Co., 1939.

2. Wintrobe, Maxwell M. Clinical hematology, ed. 3. Philadelphia, Lea & Febiger, 1951.

No Plateau in Research • Research in the medical and biological area needs to be increased with greater usage of the physical, chemical and mathematical tools. Lest we become too much satisfied with our recent accomplishments and think no more money is necessary, let us take a look at our deficit. In the field of these organic afflictions of the brain and nervous system, we are barely beyond the point of naming them accurately, and, unless they are caused by injury, infectious agent, or a cancer, we know nothing really about their origin. The whole array of mental disorders will probably some day yield to a biochemical-biophysical explanation, but as yet our book of knowledge about this, the most prevalent of disorders, is still in the preface stage. In the field of infections we have made the most notable strides, but here again the infectious agents, like all living things, eventually learn to fight back, and more and more pathogenic strains are gradually exerting a greater stubbornness about yielding to medication. An antibiotic has not been found for a virus infection, we have not succeeded in forcing the common cold to yield, and there are probably literally dozens of yet-undiscovered new strains of virus pathogens.

Lest you think I am deprecating or minimizing our forward march in medical research, let me assure you the opposite is true. The point I wish to make is—this is no time to plateau our research program. In view of the government's interest in medical research, many have asked, can industry afford to maintain or enhance its research program? To me these words are in inappropriate order. The real question is, can industry afford not to? *Lowell T. Coggeshall. Context 1:7 Spring 1961.*

Roentgenographic and direct observation of experimental lesions in bone: II

I. B. Bender, D.D.S., and Samuel Seltzer, D.D.S., Philadelphia*

To simulate periodontal and periapical lesions, bone cuts were made in mandibles from human cadavers, and the roentgenographic and visual appearances of the bone were compared. It is evident that inflammatory or tumorous lesions cannot be visualized if they are confined within the cancellous bone. However, if the lesions erode the junction area of the cortex and cancellous bone or perforate the cortex, they can be distinguished roentgenographically. Early stages of bone disease cannot be detected by means of routine roentgenograms, nor can the size of a rarefied area on the roentgenogram be correlated with the amount of tissue destruction.

In a previous investigation[1] dealing with roentgenographic appearance of experimental lesions in bone it was observed that:

1. Bone lesions could be detected on the ordinary intraoral roentgenogram only if there was (a) a perforation, (b) extensive destruction of the bone cortex on the outer surface or (c) erosion of the cortical bone from the inner surface.

2. Lesions confined within the cancellous bone could not be seen on the roentgenogram.

3. The apparent cancellous destruction or loss of trabecular pattern that is visible on the roentgenogram is often due to an erosion of the innermost surface of the bone cortex at the junction area between cancellous and cortical bone.

These observations formed the basis for the following investigations which were designed to study the roentgenographic appearance of artificially created periapical and periodontal bone lesions.

Human mandibles and maxillae, obtained at necropsy, were studied. Experimental bone lesions of various types, simulating periapical and periodontal lesions, were created by dissecting cortical and cancellous bone with reamers, files, burs and stones. Roentgenograms of the bone were taken before and after experiments. All roentgenograms were taken at the same target film distance and angulation. The films were exposed for two seconds at 65 kvp, 10 ma. and were developed together for three minutes for each study.

In addition, mandibles and maxillae were dissected to study the relation of the apical portion of the roots of various teeth to cortex and cancellous bone.

EXPERIMENTS

Artificial Periodontal Lesions • The alveolar crest was perforated and the cancellous bone was drilled with a no. 558 fis-

sure bur to a depth of 15 mm. Roentgenograms revealed a break in the lamina dura only at the crestal area where perforation had occurred. There was no evidence of rarefaction in the experimentally drilled cancellous portion of the bone.

The buccal plate was cut to simulate an infrabony pocket. Roentgenograms were taken after successively deeper bone cuts. Gradations in rarefaction could be noted, depending on how much cortex had been removed. Rarefaction increased with an increase in the amount of cortex removed. When the entire buccal plate was removed the area appeared more rarefied. It was not possible to distinguish, roentgenographically, whether the lesion was on the buccal or lingual side. However, when both buccal and lingual plates were removed, simulating an infrabony pocket with no buccal or lingual wall, a sharp contrast in rarefaction could be seen on the roentgenogram. Removal of both buccal and lingual plates produced the most distinct area of rarefaction (Fig. 1).

These experiments showed that the intensity of the roentgenographic images cast by the infrabony pockets depends on the amount of cortical destruction. Clinical infrabony pockets could exist without roentgenographic evidence of rarefaction, particularly if a small amount of cortex is lost on the root surfaces of the buccal or lingual sides. Infrabony pockets that produce light roentgenographic shadows are probably caused by loss of the inner surface of cortical bone. Pronounced rarefaction, depicted by a very dark shadow around a tooth on the roentgenogram, probably indicates that the cortex has been destroyed from both buccal and lingual sides.

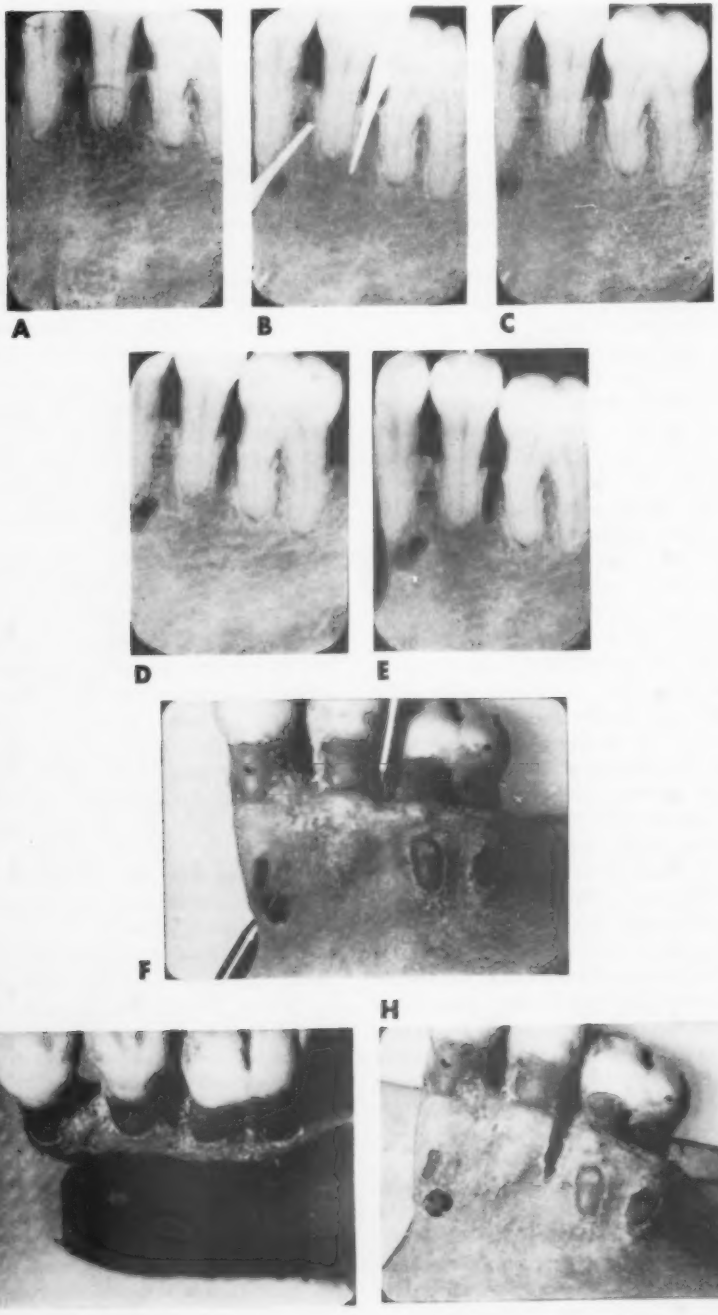
Artificial Periapical Lesions • A tooth was extracted with ordinary forceps from the mandible of a cadaver. An apical opening was made through the socket and reamers and files up to size no. 4 were introduced to a 5 mm. depth beyond the apex of the socket. Roentgenograms were taken. Burs in a gradation of sizes from no. 2 to no. 8 were then introduced into the bone through the apical opening and serial roentgenograms were taken with and without the instruments in place.

The roentgenograms revealed that no changes were produced by no. 4 reamers and files or by burs up to size no. 2. Changes of radiolucency were produced by the larger burs; the greater the bur size, the larger the areas of radiolucency. It appeared that the reamers and files destroyed cancellous bone only, hence changes were not detectible roentgenographically. When instruments which were wide enough to encroach upon the junction of cortex and cancellous bone were used, areas of rarefaction developed (Fig. 2).

Large burs produced roentgenographically observable effects because they encroached on the junction area, removed the trabeculae and eroded the inner surface of the bone cortex on the buccal or lingual side, or on both sides (Fig. 3).

Relation of Root Apices to Cortical Plate • Dissection of the mandible revealed that most of the root apices of the anterior teeth and the bicuspids were located in or near the buccal aspect of the cortical bone. In most bifurcated first molars, the mesial root was lodged near the buccal bone plate whereas the distal root was located in cancellous bone. In others, the distal root was embedded in the lingual bone plate. In most of the second molars, the root apices were suspended in the cancellous bone; in others the distal root was in proximity to the lingual plate. In some third molars the roots were lodged within or near the lingual bone plate; in others they were suspended in cancellous bone.

The apices of most teeth are lodged in or near cortical bone. Therefore, in most teeth the development of periapical lesions soon appears on roentgeno-


A
B
C
D
E
F
G
H

grams because the lesions involve the cortex sooner. On the other hand, periapical lesions may not be disclosed around teeth whose root ends are not embedded in cortex until the lesions have developed to the extent that they reach the cortex. Then roentgenographic manifestations can be observed.

This close relation of root apex to buccal cortical plate may explain why fistulation occurs on the buccal side.

The encroachment of the root apices on the cortical portion of the bone could be seen in roentgenograms of cross sections of the specimens (Fig. 4). The mandible was narrowest at the root end, with an hour-glass constriction in the anterior and bicuspid region.

The thickness of the cancellous and cortical bone varied, depending on the various parts of the mandible. In some specimens, the cancellous bone was about ½ mm. thick between the cortical plates, whereas the cortical plates were about 4 mm. thick. Nevertheless the trabeculae could be visualized distinctly. The trabeculae appeared numerous and distinct even when there was a small amount of intervening marrow space. The trabeculae were especially noticeable around the lamina dura and in the region of the alveolar crest. In the region of the lower border of the mandible the cancellous bone was less dense. The cortex narrowed considerably in the region of the alveolar process. In a number of instances there was a denudation of the buccal cortical plate over or near the root apices. These denuded areas were not observed on the lingual plate (Fig. 1).

Fig. 1 • Periodontal lesions were duplicated by drilling through alveolar crest with a bur. A: Bone before experiment. B: Drilling through alveolar crest and through cancellous bone from mesial section. Area of rarefaction was produced by cutting through cortical plate. C: After drilling. D: Removal of buccal plate. E: Removal of buccal and lingual plate. F, G, and H: Photographs of bone specimen used in the experiment. Note the areas of denuded bone over the first bicuspid and the molar. This is not evident on the roentgenograms

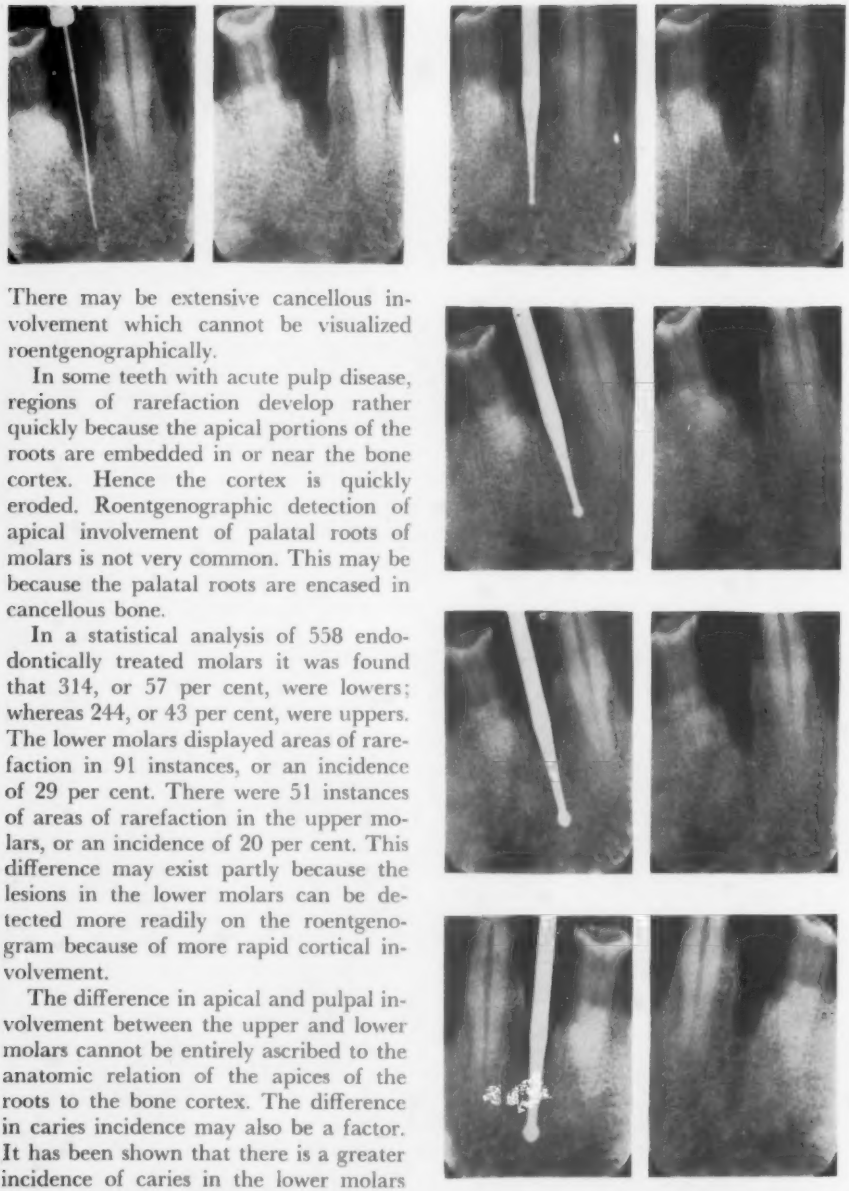
CLINICAL CORRELATIONS

Based on previous and currently reported studies some correlations with anatomic landmarks and clinical findings on bone lesions from local and systemic diseases can now be made.

Anatomic Landmarks • Anatomic landmarks, such as various foramina and canals can be visualized roentgenographically because the cortex is perforated. Nutrient canals are present in the cortex as minute tubes that exit on the surface of the bone. Therefore they, too, can be readily observed in roentgenograms.

Bone Lesions Caused by Local Factors • Roentgenograms frequently do not show any disease in acute alveolar abscesses even though a copious flow of blood and pus is present. In these instances there is pronounced tissue destruction, but the destroyed tissue is cancellous bone. Inflammatory cells are substituted for marrow cells, a pathologic condition which does not show up on roentgenograms. In time, rarefaction develops and can be seen roentgenographically. This rarefaction results from a thickening of the periodontal membrane at the expense of the lamina dura. In this instance cortical bone is involved. The area of rarefaction develops and becomes more apparent when the trabeculae are resorbed at the junction of cancellous and cortical bone.

A large granulomatous mass is occasionally attached to a root end on tooth removal, even though an area of rarefaction was not visible on the roentgenogram. Examination of the preoperative roentgenogram reveals only a slight loss of the lamina dura. When this occurs at the apical end it does not always mean that the bone is only slightly involved.



There may be extensive cancellous involvement which cannot be visualized roentgenographically.

In some teeth with acute pulp disease, regions of rarefaction develop rather quickly because the apical portions of the roots are embedded in or near the bone cortex. Hence the cortex is quickly eroded. Roentgenographic detection of apical involvement of palatal roots of molars is not very common. This may be because the palatal roots are encased in cancellous bone.

In a statistical analysis of 558 endodontically treated molars it was found that 314, or 57 per cent, were lowers; whereas 244, or 43 per cent, were uppers. The lower molars displayed areas of rarefaction in 91 instances, or an incidence of 29 per cent. There were 51 instances of areas of rarefaction in the upper molars, or an incidence of 20 per cent. This difference may exist partly because the lesions in the lower molars can be detected more readily on the roentgenogram because of more rapid cortical involvement.

The difference in apical and pulpal involvement between the upper and lower molars cannot be entirely ascribed to the anatomic relation of the apices of the roots to the bone cortex. The difference in caries incidence may also be a factor. It has been shown that there is a greater incidence of caries in the lower molars than in the upper molars.[2]

It has also been observed that initial lesions which produce roentgenographic evidence of rarefaction occur more often

Fig. 2 • Reamer and bur drilled through socket. The changes in bone can be seen as the bur size is increased. The lesion can be seen because the bur, as it gets larger, encroaches on the junction area and erodes the cortex from within.

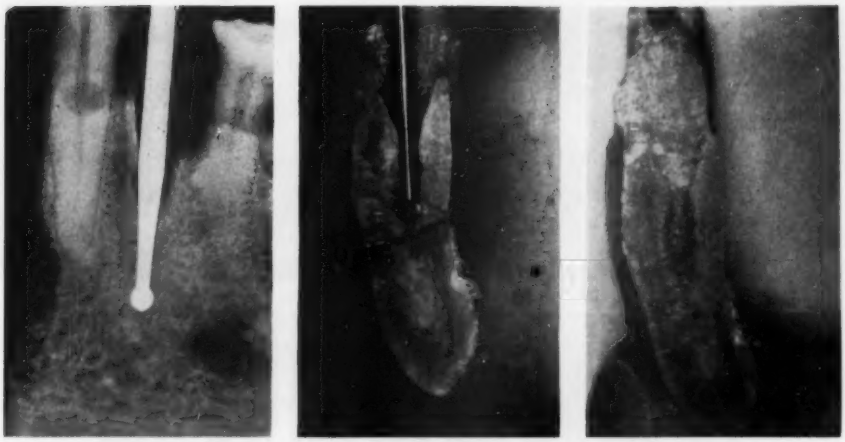


Fig. 3 • The relation of the bur to the junction area of both the buccal and lingual sides can be seen. The bur has eroded the junction area on the buccal side

on the mesial roots of lower first molars; in the later stages of inflammation, rarefaction develops around the distal root. Actually, all the roots are involved in the inflammatory process. The detection depends on the amount of cancellous bone present and the relation of the roots to the cortical plate. When the root is closer to the cortex the detection is more rapid.

The difference in the time of appearance of the lesions on the mesial and distal roots of lower first molars has been ascribed to the fact that the distal canal may have vital tissue present whereas in the mesial canal the pulp is completely necrosed. However, observations have been made in which both canals are necrotic and yet the lesion appears on the mesial root. If tissue breakdown were the only factor, then the distal root would exhibit the lesion first. This is because more tissue is present in the distal canal and a greater concentration of tissue degradation products would be present to produce an inflammatory response. Conversely, it has been observed that the pulp of the mesial root may be partially vital and the distal root completely necrosed, yet roentgenographic evidence of the lesion manifests itself first on the mesial root. A more accurate explanation may be based on the relation of the roots to the cortical plate.

Occasionally, areas of rarefaction are observed first on the apex of the distal root. This is usually seen when there is little bifurcation and the distal root is in proximity to the mesial root. In these instances there may also be a close relation between the distal root apex and the buccal plate.

Whereas the close relation of the roots to the buccal cortical bone may explain why fistulation occurs most often on the buccal side, infrequently a fistula occurs without the detectible roentgenographic bone changes. This occurs in the presence of a root that is denuded of labial or buccal cortical bone in the apical region. Therefore, the inflammatory process proceeds without destroying the adjacent bone cortex (Fig. 1). The authors do not subscribe to the idea that fistulation occurs as a result of lesser resistance.

On a roentgenogram, surgical removal of a tooth by removing the buccal plate invariably shows a distinct area of rarefaction. This occurs every time the cortex is removed. Roentgenographic examination after apical surgery also reveals ra-

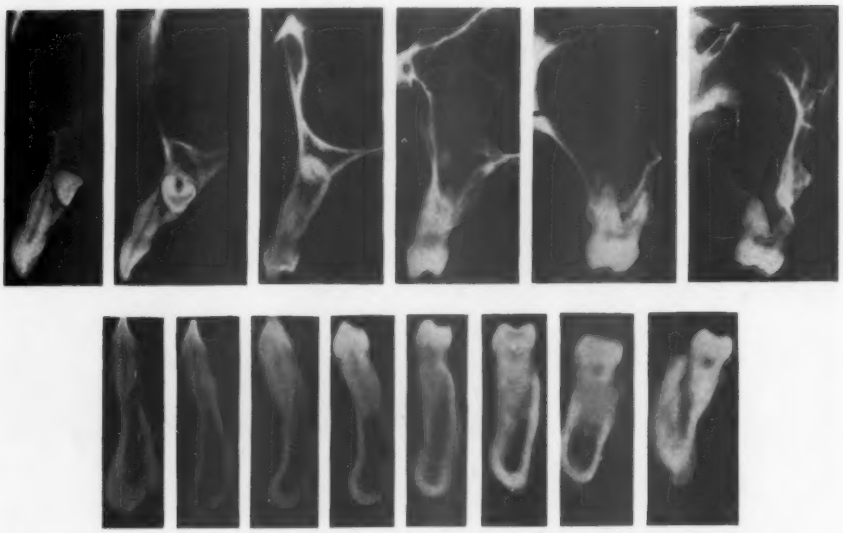


Fig. 4 • The relation of the apices of the teeth to the buccal and lingual bone plates can be seen. The apices of the upper molars, the palatal root of the upper second bicuspid and the lower second molar are encased in cancellous bone. The root of the lower third molar is in proximity to the lingual plate (Courtesy of Dr. W. J. Updegrave)

diolucent areas. Sometimes, although infrequently, bone regeneration apparently does not occur. In this condition ("operative defect") the cortex has been removed but has not regenerated. Thus, the rarefaction persists on the roentgenogram.

SYSTEMIC DISEASES INVOLVING BONE

In multiple myeloma the myeloma cells proliferate to form a myeloma cell tumor. In early stages the tumor may not be evident on roentgenograms, yet a sternal biopsy will invariably show the presence of myeloma cells in the cancellous bone. Roentgenographic changes are not seen until the cortex is infiltrated by cells, resorbed or perforated. This has been verified by studies of autopsy material. These disclose that where distinct, punched-out lesions have been found in roentgenograms, there was thinning or perforation of the cortex.[3] The darker areas represented perforations and the lighter areas indicated erosion or a carious process in the cortex.

In the early stages of Gaucher's disease, roentgenograms often do not show any disease. The diagnosis is usually confirmed by sternal biopsy. As the disease progresses the foam cells, which are characteristic of the disease, increase in number and size, invade the bone marrow and produce a pressure resorption of the trabeculae. As a result, the bone acquires a foamy appearance and there is a thinning of the cortex.[4] Films then made with routine exposures indicate pronounced rarefaction. In later stages of the disease it is necessary to reduce the exposure time for roentgenographic examination because of the thinning of the cortex (Fig. 5).

An increased deposition of cholesterol is found within the histiocytes in Hand-Schüller-Christian disease. Large granulomatous masses are produced which can be seen roentgenographically after they

infiltrate the cortical area. Here, too, sternal biopsy confirms the early presence of the disease despite the absence of initial roentgenographic manifestation.

Early stages of metastatic bone carcinoma often cannot be detected by means of roentgenographic examination, even though the patient has symptoms of bone pain. As the disease progresses it destroys more of the marrow spaces and expands toward the junction area. It invades the cortex and produces lesions which appear on roentgenograms. Shackman and Harrison[5] have demonstrated that a patient may have extensive bone metastases without demonstrable roentgenographic bone abnormality.

There are many other diseases which produce rarefied changes in the skeletal system, but the changes can be observed easier roentgenographically if the cortex has been invaded. Initial confinement of the lesion to the cancellous portion of bone prevents roentgenographic visualization of the lesion.

DISCUSSION

From these and other experiments it is evident that by the methods ordinarily employed for taking roentgenograms, inflammatory or tumorous lesions cannot be visualized if they are confined within the cancellous bone. However, lesions can be distinguished on roentgenograms if they erode the junction area of the cortex and cancellous bone or perforate the cortex because cortical bone contains more calcium per unit of volume than cancellous bone.

The experimental conditions reported here are more critical than actual clinical conditions. Tissue fluids, inflammatory cells and exudate are present in clinical conditions, whereas under the experimental conditions the bone specimen did not have fluid present in the lesion.

In view of the experimental evidence presented, early stages of bone disease cannot be detected by means of routine roentgenograms. Moreover, the size of a

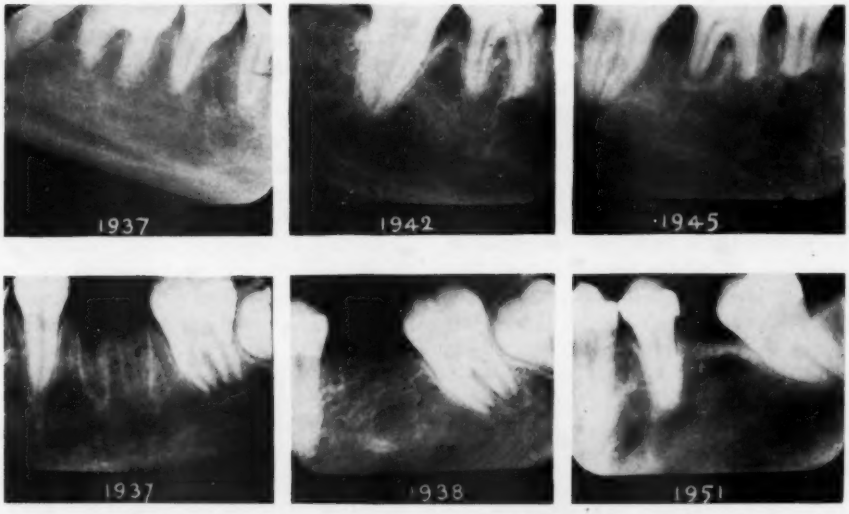


Fig. 5 • Gradual bone changes in two patients with Gaucher disease that were observed from 1937 to 1951 are shown. As the disease progressed there was a gradual loss of trabecular structure. The cortex became thinned as the Gaucher cells began to expand toward the cortex by encroaching on the junction area and crowding out the trabeculae. Biopsy confirmed presence of Gaucher cells in this area

rarefied area on the roentgenogram cannot be correlated with the amount of tissue destruction. A small area of rarefaction on a roentgenogram can be indicative of as much, or more, bone destruction as a large rarefied area.

SUMMARY

Mandibles from human cadavers were dissected and bone cuts were made to simulate periodontal and periapical lesions. Comparisons were made of the roentgenographic and visual appearance of the bone.

It was found that the artificial lesions could not be visualized on the roentgenogram if the lesions were confined within cancellous structure. If, however, the lesions were enlarged so they encroached on the junction area of the cancellous and cortical bone they could be seen on the roentgenogram. If sufficient bone tissue was removed to erode the inner surface of the bone cortex, the area became even more rarefied and discernible. Thus, it was shown that lesions produced by local diseases such as acute inflammation and systemic diseases of the skeletal system, including metastatic carcinoma, cannot be visualized easily on the roentgenogram if they are confined within the cancellous bone. Correlations were made of these findings with clinical bone lesions.

Dissections of the mandible and maxilla revealed that most root apices are in juxtaposition to the buccal cortex. The roots of lower third molars, in most instances, are in proximity to the lingual bone plate. The distal root of a bifurcated lower first molar, the roots of the lower second molar and most upper molars, particularly the palatal root, are encased in more cancellous bone.

A study of 558 endodontically treated molars revealed that more lower molars than upper molars exhibit areas of rarefaction. This variation may exist because the upper molars are encased in cancellous bone, hence the lesion cannot be readily visualized on roentgenograms. It could also be due to a greater caries incidence in the lower molars. Roentgenographic detection is not facilitated until expansion of the lesion with erosion of the innermost surface of the cortex occurs. However, roentgenograms cannot disclose whether the lesion is on the buccal or lingual side.

Further explanations have been made of the significance of these findings to various dental and systemic clinical conditions.

From Albert Einstein Medical Center, Northern Division, department of dentistry.

*Associate professor in oral medicine.

†Associate professor in histopathology, School of Dentistry, University of Pennsylvania.

1. Bender, I. B., and Seltzer, S. Roentgenographic and direct observation of experimental lesions on bone: I. J.A.D.A. 62:152 Feb. 1961.

2. Knutson, J. W.; Klein, H., and Palmer, C. E. Studies on dental caries. VIII. Relative incidence of caries in different permanent teeth. J.A.D.A. 25:123 Dec. 1938.

3. Levitt, A., and Levy, D. S. Multiple myeloma. Ann. Int. Med. 17:863 Nov. 1942.

4. Bender, I. B. Dental observations in Gaucher disease; a twenty year follow up. Oral Surg., Oral Med. & Oral Path. 12:546 May 1959.

5. Shackman, R., and Harrison, C. V. Occult bone metastases. Brit. J. Sur. 35:385 April 1948.

A Chemical Matter • It seems extraordinary, but it is true, that only four years ago the first modern so-called tranquillizing drugs reached the market. Since the earlier discovery that some ancient remedies from India did have a scientific respectability after all, discovery after discovery has been made to the effect that what we think and what we are is to a large extent a chemical matter. *Frank Stanton, Stanford University Medical Center Dedication Ceremony, September 18, 1959.*

Role of prevention in military dentistry

Joseph L. Bernier, D.D.S., M.S.,*
and Thomas A. McFall,† D.D.S., Washington, D. C.

Present technics and manpower are inadequate to meet the demands for dental treatment in all the military services. One solution is a military preventive dentistry program, and the Army is establishing such a program, with the advice of an ad hoc committee of civilian and military workers in preventive dentistry. Long-term aspects of the program involve acceleration of advanced dental education and of clinical and basic research.

In the light of the recent Survey of Dentistry there is an urgent need to assess critically our present philosophy of dental practice, with the view of placing more emphasis on research and the prevention of oral disease. Numerous studies show that dental disease affects approximately 95 per cent of the population,[1] and that clinical capabilities are inadequate to provide all the required dental treatment. Further, the manpower required for this dental treatment poses a serious military problem, as does the high rate of troops considered noneffective due to dental causes. In the face of this assessment it is logical to use all available preventive methods to supplement our clinical efforts. We propose to discuss some of these basic problems, and to suggest how preventive programs can be of major assistance in their solution.

The practice of dentistry in the military does not differ essentially from that in civilian communities; however, major factors exist in relation to the timetable which directs when it must be accomplished in the military. Some of the more important are:

1. The training cycle for inductees is 16 weeks long.
2. Follow-up treatment must be rapidly completed for troops going overseas.
3. Comprehensive initial dental treatment and periodic care must be provided for the career military population stationed throughout the world.
4. Emergency and definitive treatment must be provided in the field, under conditions which become increasingly more difficult as combat operations become mechanized and more complicated.
5. Military dental officers have additional administrative and management problems, particularly in field training and combat situations which are not encountered in civilian life. Thus the first problem in military dentistry lies in the timing and locale of dental treatments.

The second problem is related to the limited knowledge of the precise causes of oral disease. There is reasonable evidence that dental caries occurs only in the presence of complicated oral microbial flora and a nutritional medium that supports microbial growth. This thesis has been well investigated and supported by the work of Orland and others[2] on

germ-free animals. Opinions are sharply divided concerning the organisms that are directly concerned in the production of caries. Further, the precise biological and chemical mechanisms responsible for the initial decalcification of enamel and ultimate invasion of dentin remain subjects of debate.

Knowledge of the etiology of periodontal disease is somewhat less reliable than that of dental caries. There are data to indicate that local factors, principally noncalcified and calcified bacterial plaques, play a dominant role in the etiology of periodontal disease. There is also evidence that disturbances in organ systems associated with disease and the passage of time may play an important role in the degenerative forms of periodontal disease.

In spite of what appears to be a paucity of information on the cause and nature of these two diseases, much can be done to control their occurrence, as will be discussed later.

The third problem lies in the overwhelming disparity between the dental treatment required by the military and the capability to accomplish this treatment through clinical means alone. In a study of the dental treatment required for each 1,000 Army inductees, it was found that they required:[3] restorations, 7,940; surgical procedures, 700; complete dentures, 15, and partial dentures, 160.

For the past several years, prior to 1958, the average monthly input to the Army has been 28,000 men. The total monthly increase in dental treatment required for inductees, therefore, would be: restorations, 222,320; surgical procedures, 19,600; complete dentures, 420, and partial dentures, 5,480.

Szmyd and McCall[4] studied the restoration requirements of 26,369 incoming enlisted personnel at 48 Air Force installations. They estimated that 2,810,448 restorations would be required for the teeth of 724,956 enlisted personnel.

Hellman and his associates[5] reported that 90.3 per cent of all naval recruits required fillings, and 31 per cent needed extractions. Rovelstad and associates[6] reported that only 20.8 per cent of naval recruits were clinically free of gingival disease. Similar studies on civilian groups over the years have been in close agreement with these findings concerning the high incidence of dental diseases.

The fourth major problem in a military dentistry program concerns noneffective time and the manhour debt. We have not, as yet, been able to obtain the precise figures for the time involved in complete treatment for any group of 1,000 Army inductees. We have, however, estimated the manhours spent by troops in obtaining the dental treatment they received in one year. These figures, added to manhours expended by dentists and paradental personnel, reveal that 17,752,560 hours would be required to accomplish the dental treatment required by Army personnel, in 1958. These hours equal approximately 739,690 days during a period when 365 days were available, even if all personnel were on duty 24 hours per day.

Manhours expended in dental treatment

Dentists (2,043)	3,992,560
Patients reported manhour workload	8,000,000
Paradental personnel (3,000)	5,760,000
Total	17,752,560

This 8 million figure represents required treatment as listed in monthly reports of Army dental services. It does not represent the time needed for completion of the total Army workload. Modern military weapons and combat technics place great reliance on availability of manpower with upgraded training and skills for operating complicated field equipment. Having men away from duty, even for short periods, interferes with operations and training in the present

mechanized and specialized Army. An appraisal of noneffective time due to dental causes reveals a loss of manhours equivalent to the full-time services of 10,000 soldiers, or approximately two thirds of a division.

Further studies show that we do not have the capability to fulfill our dental treatment requirements. Szmyd and McCall[4] reported that only 1,762,680 restorations were accomplished of the estimated 2,810,448 restorations needed by Air Force personnel, in 1958. This represents an accumulated dental treatment deficit which cannot be reduced by present methods of treatment and the present ratio of dental officers to troops.

We have expressed our Army annual dental deficit in manhours as follows:

	Manhours
Dental treatment hours required	8,000,000
Annual increase in caries alone	4,000,000
Dental officer hours available	4,000,000
Dental treatment deficit	8,000,000

We have an 8 million manhour treatment load with an annual increase of 4 million that are required for treating recurrence of dental conditions. This makes a total workload of 12 million manhours.

When the 4 million dental officer hours available is subtracted from the total 12 million load, there remains an annual 8 million manhour dental treatment deficit.

From this, it is clear that present technics and manpower are inadequate to meet the demands of dental treatment in all the military services.

MILITARY PREVENTIVE DENTISTRY PROGRAM

New and improved dental materials and equipment, and a greater understanding of the nature of oral disease, have raised the quality standards of dentistry, so that better dental care is provided today than at any time in our history. Unfortunately, this superlative dentistry cannot be provided for troops rapidly enough to meet the exigencies of military service. High-speed cutting instruments, more accurate refractory investment materials and other therapeutic innovations have not noticeably increased dental treatment productivity to date. Since the primary mission of military dentists is to conserve the health and manpower of the Army, every available means must be utilized to reduce noneffective manpower. We have added another tool for the control of dental disease by placing Army-wide emphasis on a preventive dentistry program.

The program consists of immediate and long-range objectives in preventive dentistry technics and research. The immediate objectives are designed to start a preventive program now, with the present available means. We will depend on the fruitfulness of the long-range objectives for nurturing and developing the young military preventive program to a profitable maturity.

We must first develop the organization, and to this end preventive dentistry sections at appropriate staff headquarters and in large military installations have been established. Preventive dentistry officers have been selected for each situation. Army and command dentists now are responsible for stimulating and coordinating preventive dentistry programs in military installations under their supervision. Installation dentists now are responsible for preventive dentistry sections and for assigning a preventive dentistry officer to develop and conduct programs in preventive dentistry having the following objectives:

1. The initiation of comprehensive educational programs for dental officers in preventive philosophy and technics. The procurement of training aids, models, pamphlets and other educational materials which may be obtained from the Bureau of Dental Health Education of the American Dental Association, and the Walter Reed Army Institute of Research.

2. The initiation of clinic policies for instructing patients in personal oral hygiene. Each dental officer to teach his patients appropriate toothbrushing, as well as denture and other oral hygiene practices, at each appointment. The degree of proficiency in oral hygiene procedures to be checked at the last appointment.

3. Systematic examinations and checkups to be made to determine if toothbrushing and other oral hygiene practices are being carried out effectively. Further instruction may be provided at this time.

4. The instruction of troop information and education officers in the philosophy of preventive dentistry. Suitable pamphlets on oral hygiene and lectures by dentists on oral hygiene for troops to be offered for inclusion in this information program. Appropriate posters to be developed for display in the troops' living areas.

5. Assuring the cooperation and education of public relations officers at the posts, so that suitable publicity on the importance of hygiene and preventive dentistry activities appears regularly in post and civilian publications.

6. Provision of training for medical and nursing staffs to insure the continuation of oral hygiene practices for hospital patients, especially those patients who are unable to provide their own oral care during severe acute or chronic illnesses.

7. Obtaining the understanding and cooperation of troop commanders in establishing oral hygiene discipline, so that dental disease may be prevented as other diseases are prevented by hygiene discipline.

8. Establishment of preventive dentistry clinics whose mission is to:

a. Provide training in dental hygiene practices.

b. Present oral hygiene and dental treatment lectures to interested groups. Cooperation with existing prenatal clinics may be profitable.

c. Cultivate the use of the Army visiting nurses in bringing oral hygiene training into the homes. Oral hygienists also may be effective in school and home educational visits.

d. Provide guidance and advice in preventive dental care for children and families in all instances. Include topical stannous fluoride applications to children's, as well as young adults', teeth. Information concerning the technic of applying stannous fluoride, as well as the material itself, to be secured from the Division of Dentistry, Walter Reed Army Institute of Research. Complete all therapeutic, as well as preventive, services for dependents of military personnel wherever local conditions permit.

Considerable progress has been made in the second early objective of providing the education and training in preventive dentistry concepts for officers who are responsible for implementing the programs. A postgraduate course in preventive dentistry is scheduled for June 1961, at Walter Reed Army Institute of Research. This course will be attended by Army installation dental surgeons and a group of highly motivated young officers who have been selected to serve in preventive dentistry assignments. A comprehensive review will be conducted in the technics and principles of preventive dentistry and public health. Seminars will be conducted on the preventive aspects of periodontics, prosthodontics, oral surgery, restorative dentistry, endodontics, and dental research. Teaching materials and guidance for preventive dentistry officers will be given to the students to aid them in carrying out the dental health responsibilities of their preventive dentistry assignments.

A third immediate objective is the extension of preventive dentistry training to career and company officer courses and enlisted technicians at the Medical Field Service School. Early indoctrination of recently commissioned dental officers will

be designed to prepare them for the transition from the philosophy of dental school and civilian practice to that of military preventive dentistry methods. Emphasis will be placed on the teaching roles and responsibilities of both dentists and technicians in instructing troops and commanders in dental health practices for garrison and field service.

Another, and perhaps the most rewarding, of our immediate organization efforts is the appointment of an *ad hoc* committee of experienced civilian and military workers in preventive dentistry to study and advise in the further planning of this program. Subcommittees may concentrate efforts in solving unique problems.

EDUCATION AND RESEARCH

There is a close interrelation and interdependence between dental treatment, dental research and dental education. It is unwise, unprofitable and frustrating to divorce one from the other. Therefore, our long-range objectives are concerned chiefly with future research and advanced dental education.

One of the program's long-range objectives is increased opportunity for graduate training in public health dentistry for Army dental officers. Officers with such formal training would be eligible for the advanced military preventive medicine course now offered for medical officers at the Walter Reed Army Institute of Research. Graduates of these courses would possess excellent qualifications for assignments in Army headquarters, dental services at large posts and as teachers in the Army postgraduate education system. The present postgraduate course and the preventive dentistry training offered in our long course in general dentistry, will satisfy the immediate requirements of preventive dentistry training until the long-range program is firmly established.

Equal priority and acceleration must be given to advanced training in the biological sciences. Additional adequately trained investigators are needed to conduct basic research on the preventive aspects of nutrition and to continue to search the oral environment for more precise information on the etiology of dental caries and periodontal disease. A review of the progress of preventive medicine shows a tremendous increase in its effectiveness after the discoveries of sulfonamides, the antibiotics, and the more recent vaccines for poliomyelitis and influenza, and numerous other disease prevention and control agents. Our breakthrough for dental disease ultimately lies in the hands of researchers with depth of training and experience.

We must continue to train clinical specialists, and our need for dental officers skilled in biochemistry, virology, physiology, microbiology, and pathology is not to be accomplished at the expense of such clinical training, but in addition to it.

Much remains to be accomplished in both clinical research and in basic research. We must develop effective and more rapidly applied treatment procedures in both the immediate and near future. For example, dentistry urgently needs:

1. A filling material that will bond with the molecular structure of teeth, will resist the stresses of mastication, and can be placed quickly.

2. Studies designed to measure and evaluate the results of upgrading the clinical capabilities of paradental personnel. Twenty-five years ago Strusser[7] and others advocated the delegation of certain treatment procedures to clinical technicians. Renewed interest in this philosophy has arisen in recent years, but valid measurements of its effectiveness are not yet available.

3. An appraisal to determine the effectiveness and practicability of applying multiple-unit operation with increased assistant teamwork in military

clinics. Waterman[8] and other investigators have shown that this approach significantly increases the capability of dentists to provide more treatment for more people.

4. To investigate further the effectiveness of recently modified office practice and equipment to reduce stress on the operator and increase his capabilities to care for more patients.

The application of public health philosophies in military preventive dentistry will go a long way in solving a major part of our dental treatment problems.

SUMMARY

The problems of military dentistry have been presented, and some of the differences between military and civilian dentistry have been discussed. There is a great disparity between required dental treatment and our capability to provide this care. Disease prevention is essential to reduce noneffective time and the tremendous manhour deficit.

One solution for these problems is a military preventive dentistry program, and the Army is in the process of establishing such a program. Preventive dentistry sections at staff headquarters and large military installations have been established. Arrangements are being made for education and training in preventive dentistry concepts for officers responsible for implementing the programs. Preventive dentistry training will be extended to other dental officers and technicians. An *ad hoc* committee of civilian and military workers in preventive dentistry will study and advise in the further planning of this program.

Long-term aspects of the preventive dentistry program involve acceleration of advanced dental education and both clinical and basic research.

*Major general, Dental Corps, U. S. Army. Assistant Surgeon General and chief of the Army Dental Corps.

†Colonel, Dental Corps, U. S. Army. Director, Division of Dentistry, Walter Reed Army Institute of Research.

1. National Academy of Sciences—National Research Council. Survey of the literature of dental caries. Washington, D. C., National Academy of Sciences, 1952.

2. Orland, F. J., and others. Use of the germfree animal technic in the study of experimental dental caries. I. Basic observations on rats reared free of all microorganisms. J. D. Res. 33:147 April 1954.

3. Hobson, R. W. Dental examinations of 8,139 Army recruits; preliminary report. U. S. Armed Forces M. J. 7:1648 Nov. 1956.

4. Szmyd, Lucian, and McCall, C. M. Restorative dentistry workload of U. S. Air Force dental service. U. S. Armed Forces M. J. 11:1011 Sept. 1960.

5. Hellman, L. P.; Ludwick, W. E., and Oesterling, B. W. Naval dental needs and treatment. J.A.D.A. 55:828 Dec. 1957.

6. Rovelstad, G. H., and others. Survey of dental health of the naval recruit. I. Status of dental health. J.A.D.A. 58:60 May 1959.

7. Strusser, Harry. Unpublished communication with T. A. McFall.

8. Waterman, G. E. Effective use of dental assistants. Pub. Health Rep. 67:390 April 1952.

Developing Imbalance • Census figures for the decade from 1941 to 1950 show that workers in science and technology were rapidly overhauling teachers as the largest of professional groups. In that decade the scientists and engineers almost doubled in numbers, while the teachers increased by only 10 per cent. (It is worth noting that the census put persons who were both scientists and teachers into the category of teachers.) If there has been anywhere near a proportionate increase in the decade 1951-60, professional workers in science and technology now greatly outnumber both teachers and professional workers in health and constitute about 30 per cent of the entire professional element of our population (6 to 7 million persons). The task of the academic scientists is to continue to train this rapidly growing body of professional people, even though their own numbers are increasing much more slowly. *Bentley Glass, The Academic Scientist, 1940-1960. Science 132:599 September 2, 1960.*

editorials

Research versus repair in the eradication of dental disease

Recently there was presented to THE JOURNAL a lengthy, well-written article concerning the worth of the New Zealand school dental health program and extolling the merits of the New Zealand school dental nurses. Included in its thirty-five closely packed pages was one short paragraph on dental health education but not one line on dental research.

Therein, it would appear, lies the difference between the New Zealand and the American approach to a solution of a common health problem. To raise the level of its dental health, New Zealand continues to rely on repair whereas America now pins its hopes on research. This is not to say that no dental research is being conducted in New Zealand or that preventive—reparative—dentistry for children has lost ground here. Not at all. It is merely to say that in matters of dental health our sister nation continues to rely primarily on her school reparative service, now in its fortieth year, and secondarily on scientific research, whereas in the United States, during the past ten years, research has assumed the superior position.

Prior to World War II American dentistry, like dentistry elsewhere, relied on early operative care for children as a principal means of controlling dental caries. Although the need for dental research was recognized, the paucity of funds for that purpose seemed to present an insurmountable barrier. In the late nineteen forties leaders in the American Dental Association, realizing the improbability of enlisting sufficient aid—financial and otherwise—from private sources to establish a research program commensurate with the size and seriousness of the problem, turned to the federal government for assistance. By dint of much pressure on the part of the Association, federal aid was forthcoming.

The progress made in all fields of dental research since 1950 is too well known to need repeating here. During that period the federal government's appropriations for dental research and public dental health activities have increased from approximately $1,800,000 to approximately $15,500,000, an amount which the American Dental Association urges be raised in the next national budget to at least $25,000,000.

Federal funds have made possible the initiation and expansion of dental research programs in all of America's dental schools and in a number of other teaching and scientific institutions. A modern five story building has recently been completed and is being furnished with the latest scientific equipment at Bethesda, Maryland, for the National Institute of Dental Research. Water fluoridation has become a successful reality in some 2,000 American communities serving some forty million people. Sodium fluoride and stannous fluoride applied topically to teeth have proved their worth as anticariogenic agents. In addition hundreds of other research studies are under way, some of which bear promise of being even more beneficial than those just mentioned. Undoubtedly the nineteen fifties will be recorded in dental history as the decade which gave birth to the scientific attack on dental disease—one which terminated in the complete prevention of dental caries and in the control of other major dental disorders.

The New Zealand program and the American program have two things in common. First, both programs depend for their success on the cooperation of the national government and the dental profession. Second, both programs have a common goal although each travels a different way to attain it. Time will tell which way is the wiser.

Arthur H. Merritt, former Association president, wills generously to the library fund

Four months ago—on February 9 to be exact—one of dentistry's noblemen, Arthur Hastings Merritt, departed this earth. During sixty-five of his ninety-one years he gave unstintingly, unselfishly and untiringly to his profession which he loved so well and through his profession to the public which he loved with equal ardor.

His contributions to dentistry and to mankind did not die with his death. Some of them will last long into the future. One such bequest, consisting of $5,000, was made to the American Dental Association, "preferably," as he stated in his will, "for the library fund."

Thus, in closing the last chapter of a long and useful life, Dr. Merritt, former president of the American Dental Association, leaves to those who follow, many of whom may never know his name, a literary gift the worth of which will grow greater with each passing year. Many times during Dr. Merritt's active professional life, the American Dental Association had occasion to express its gratitude for some outstanding service which he performed in the interest of dentistry. On this occasion, the last in a long series, it once again registers its indebtedness to one of its most gracious members.

National Institute of Dental Research building dedicated May 26

May 26, 1961 may well be recorded in the archives of the profession as one of the more memorable dates in dentistry. It marks the realization of a proposal first made by the Association more than twelve years ago. It is the date on which the new home of the National Institute of Dental Research was dedicated. Furnished with the latest and best scientific equipment, this modern five story structure will be devoted exclusively to the study of problems associated with dental disease. To and from its conference tables and administrative offices will flow streams of communication with dental schools and other research institutions bringing about better liaison and more effective cooperation between the nation's widely scattered corps of dental scientists.

By constructing and staffing this 4,000,000 dollar scientific laboratory, the federal government has recognized the nation's dental problems and indicated a willingness to cooperate with the dental profession in an effort to solve them. Certainly the profession can do no less than to reciprocate by intensifying its interest and its efforts in all aspects of dental research.

Although the new home of the National Institute of Dental Research has frequently been referred to as a monument to dental science, it may also be considered as symbolic of the good that can accrue from the cooperative efforts of governmental and private agencies. It is hoped that when the nation's new dental research center gets fully under way it will encourage the development of more dental researchers and stimulate more dental research supported, if necessary, by more federal funds in order that a major breakthrough soon will be made in the profession's crusade against dental disease.

1961

State Dental Association Presidents

Hubert Anthony McGuirl is president of the Rhode Island State Dental Society. A general practitioner in Providence, Dr. McGuirl received his A.B. in 1929 from Boston College, and a D.D.S. in 1933 from Georgetown University School of Dentistry. He is a member of the Northeastern Dental Society, the New England Dental Society, and a Fellow of the American College of Dentists and the International College of Dentists. Dr. McGuirl served as president of the Providence District Dental Society in 1955. From 1957 to 1960 he was executive secretary of his state dental society. In 1959 he served on the American Dental Association's Council on Insurance. He was chairman of the committee which established the Rhode Island State Dental Society's postpayment plan for dental care, one of the first such plans in the East. He organized and was the first chairman of the New England Insurance Study Committee, and was chairman of the committee which organized the New England Dental Health Conference. Dr. McGuirl is married and the father of three—Hubert A., Jr., 24; Michael L., 21, and James Joseph, 15. His hobbies are boating, photography and amateur electronics.

Howard Yost, president of the Nebraska State Dental Association, is an orthodontist practicing in Grand Island. He is a member of the American Association of Orthodontists, and of Fédération Dentaire Internationale. Dr. Yost has served as president of the Northwest District Dental Society and in 1955 was president of the Central Section, American Association of Orthodontists. He is a member of the Rotary Club and the American Legion. He is the author of several papers on orthodontics which have appeared in the *American Journal of Orthodontics* and the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION. Married, Dr. Yost is the father of a daughter, Phyllis Yost Stilwell, and of two sons, both physicians—John G. Yost, M.D., and Howard Fulton Yost, M.D. Dr. Yost is a vestryman and senior warden of St. Stephens Episcopal Church, and a member of the bishop's council, Diocese of Nebraska. He has tapered off on his former hobbies of golf, fishing and hunting, in favor of his bigger hobby of nine grandchildren.

H. A. McGuirl
Rhode Island

H. Yost
Nebraska

C. W. Nickels, a general practitioner in Walnut Ridge, is president of the Arkansas State Dental Association. Dr. Nickels obtained his B.S.A. degree from the University of Arkansas in 1938, and his D.D.S. degree from Baylor University College of Dentistry in 1949. He has filled all posts in the Northeast Arkansas District Dental Society and has served for five years on the executive council of his state association. Dr. Nickels is a past president of the Arkansas unit, American Society of Dentistry for Children. He is president of the North East Central Arkansas Horse Show Association; past president, Lawrence County Saddle Club; member of the board of directors, Walnut Ridge Chamber of Commerce, and a member of the Kiwanis Club. He also is a member of the official board of the Methodist Church. Married, Dr. Nickels is the father of a daughter, Nancy, 17. He served in the U.S. Army (infantry) from 1941 to 1946 and was discharged as a lieutenant colonel. He had served in both the European and Pacific theaters. His hobbies are horses, hunting and watching football games.

C. W. Nickels
Arkansas

Vivian David Cooper, president of the Alabama Dental Association, received his D.D.S. degree from Vanderbilt University School of Dentistry in 1926. A general practitioner in Birmingham, Dr. Cooper is a past president of the Birmingham District Dental Society and the Alabama Dental Golf Association; a Fellow of the American College of Dentists, a member of the Pierre Fauchard Academy; a charter member of the Southeastern Academy of Prosthodontists, and he holds membership in the Kiwanis Club, Masonic Order, Shriners, and the local chamber of commerce. From 1948 to 1953 Dr. Cooper served as a part-time instructor in prosthetic and restorative dentistry at the University of Alabama School of Dentistry. Dr. Cooper is married and the father of four: Dr. Kenneth W., a dentist, of Sarasota, Fla., 30; Mrs. Carl Gates, 26; Katherine, 23, and Donald, 17. President Cooper's hobbies include fishing, hunting, and growing orchids and camellias.

L. D. Wright, president of the Oklahoma State Dental Association and a general practitioner in Oklahoma City, received an A.B. degree in 1935 from Marshall College and a D.D.S. degree in 1939 from Louisville University. He served his state association as secretary-treasurer from 1958 to 1960, and as an alternate councilman and an alternate delegate to the annual session of the American Dental Association. A Fellow of the American College of Dentists, Dr. Wright is a member of the American Society of Dentistry for Children, of the Pierre Fauchard Academy, and a member of the local chamber of commerce. He is married and the father of Lee and Linda, 17.

V. D. Cooper
Alabama

L. D. Wright
Oklahoma

news of dentistry

Surgeon General Terry pledges vigorous support of fluoridation at Dental Health Conference

Surgeon General Luther L. Terry of the Public Health Service pledged his agency's vigorous support for fluoridation of public water supplies at the twelfth National Dental Health Conference, April 26-28, in Chicago.

Other speakers at the conference discussed the problems of achieving fluoridation of community water supplies, dental care for the chronically ill and aged, incremental care programs for children, and the expanding role of dental auxiliaries.

Dr. Terry, delivering the keynote address April 26, termed fluoridation the most effective and economical weapon against tooth decay. The fact that only one third of the nation's urban population is being protected by it, is, Dr. Terry said, a startling and disturbing fact. He said that the 1960 elections, when 29 out of 35 communities rejected fluoridation referendums, "were nothing short of a tragedy." In addition to his pledge for support of fluoridation, Dr. Terry called for more dental education research and expanded community service.

A declaration of war against those who would deny the benefits of fluoridation to our children was proposed by Donald R. McNeil, author of *The Fight for Fluoridation*.

Dr. McNeil warned the health professions they must accept the fact that the fluoridation issue has become political rather than scientific and prepare themselves for the battle. He said ten thousand more scientific experiments will not help. Pointing out that fluoridation is approved everywhere except in the public mind, Dr. McNeil urged dentists, physicians and public health officials to adopt a militant stance and undertake an all-out effort to publicize and promote fluoridation at every level.

Stanley J. Buckman, Memphis, Tenn., biochemist, suggested the use of petitions in the offices of dentists, physicians and pharmacists as an alternative to referendums on fluoridation. This might, he said, provide a calm atmosphere for deciding the issue in contrast to the emotional one characteristic of referendums.

Only a tragically small minority of the nation's children is receiving complete dental care today, charged Wesley O. Young, chief of Idaho's dental health section. This situation exists, he said, despite the tremendous wealth of this nation, the high level of educational attainment, and the technical proficiency of the dental profession. Eight million children 5 to 18 years of age have never been to a dentist, he went on.

Dr. Young emphasized that a child is dependent on others to safeguard his own welfare. Provisions must be made, he asserted, for partial subsidy of the dental care cost for low income families who are not indigent, and full subsidy for those who are completely unable to pay for services.

Dr. Young described a community program in which complete dental care would be given first-grade children. The next year, these children would receive maintenance care and a new first-grade group would be added, until the program would be providing initial care to six-year olds and maintenance to children 7 through 16 years of age. The program, he said, also would entail community plans to educate, motivate and demand that parents who are able to pay for care assume the responsibility of maintaining their children's oral health.

Gerald L. St. Marie, New Haven, Conn., suggested that the American Dental Association organize a committee on gerontology as part of the Council on Dental Health. Such a committee, he said, would organize regional meetings for the purpose of exchanging ideas and developing information on the dental care of the chronically ill and aged.

Association Affairs

PRESIDENT'S DENTAL-MEDICAL SCHOOL AID PLAN SUPPORTED

Congress was told April 28 that the American Dental Association strongly supports President John F. Kennedy's bill for aid to medical and dental schools. William R. Mann, consultant to the Association's Council on Legislation, testifying before the subcommittee on health of the Senate Committee on Labor and Public Welfare, said that unless there is immediate federal assistance to expand educational facilities, soon there will not

Surgeon General Luther L. Terry (inset, right) of the Public Health Service pledges his agency's vigorous support for fluoridation of public water supplies to the National Dental Health Conference. Harold Hillenbrand (inset, left), secretary of the American Dental Association, introduced Dr. Terry to more than 100 participants (large photo) meeting April 26-28 in Chicago.

be sufficient dental personnel to care for the public.

He pointed out that the situation is complicated by expanding population and increasing demand for dental care. In order to maintain the present dentist-population ratio during the next 15 years, Dr. Mann said, it will be necessary to almost double present dental school capacity. He added that the equivalent of 23 new dental schools will be needed in the next decade.

Dr. Mann said that the American Dental Association officially favors federal aid to education provided such aid does not affect admission policies of the schools and does not affect the content of the curriculum.

Dr. Mann quoted the cost in the coming decade to be $242,000,000 for construction of new schools and expansion and restoration of existing schools if the present dentist-population ratio is to be maintained.

RUSSIAN DENTISTS VISIT U.S. SCHOOLS, HOSPITALS

Five Russian dentists, on an exchange mission with the American Dental Association, visited in the United States April 26-May 23. While in this country, they toured dental schools and hospitals in New York, Philadelphia, Chicago and Washington, D.C. A group of American dental representatives will make a similar visit to Russia June 3-25.

Members of the Russian dental mission were: Aleksei Ivanovich Doinikov, Moscow Stomatological Institute; Vladimir Feodorovich Chekin, director of Laboratory of Surgery, Moscow; Voyacheslov Ivanovich Karnitski, Omsk Institute, Siberia; Anatoli Ivanovich Rybakov, Moscow Stomatological Institute; (Mrs.) Antonina Illarionovna Pozdnyakova, Kiev Medical Institute.

The American delegation will consist of: Harold Hillenbrand, secretary, American Dental Association; Charles H. Patton, Association president; John R. Abel, Association president-elect; Gerald D. Timmons, speaker of the House of Delegates; John W. Knutson, chief dental officer, U.S. Public Health Service; Thomas J. Hill, former chairman, Council on Dental Research; Arthur F. Schopper, former trustee of the Sixth District, and Francis A. Arnold, Jr., director, National Institute of Dental Research.

While in the United States, the Russians saw the University of Pennsylvania School of Dentistry, Temple University School of Dentistry, Albert Einstein Medical Center's Dental Division, Central Office of the American Dental Association, Northwestern University's Cleft Palate Institute, Joseph E. Kennedy Dental Laboratory, Walter G. Zoller Memorial Clinic, Evanston, Ill., water fluoridation plant, University of Illinois College of Dentistry, Veteran's Administration West Side Hospital, S. S. White Manufacturing Co., New York University College of Dentistry, Bellevue Hospital, Institute of Physical Medicine and Rehabilitation, Columbia University School of Dental and Oral Surgery, New York City Community College, United Nations building, Walter Reed Army Medical Center, Armed Forces Institute of Pathology, U.S. Navy Dental School, National Institute of Dental Research, and National Bureau of Standards.

The Americans will visit various dental, medical, scientific and cultural institutes in the cities of Moscow, Leningrad, Kiev, Tiflis and Sochi.

ENNIS NAMED DELEGATE TO F.D.I. MEETING IN HELSINKI

LeRoy M. Ennis has been named an Association delegate to the Helsinki, Finland, meeting of the Fédération Dentaire Internationale, July 9-15, 1961, taking the place of Gerald D. Timmons. Dr. Ennis' former position as an alternate has been filled by Maynard K. Hine. Other delegates are: Charles H. Patton, John R. Abel, Harold Hillenbrand and Obed H. Moen. Alternates are: Edward F. Mim-

Five Russian dentists, members of a dental exchange mission, recently toured U.S. dental schools and hospitals at the invitation of the American Dental Association. The Russian delegation is shown during its visit to the Central Office of the Association in Chicago. From the left: Vladimir Feodorovich Chekin, director, Laboratory of Surgery, Moscow; Antonina Illarionovna Pozdnyakova, Kiev Medical Institute; Harold Hillenbrand, Association secretary; Aleksei Ivanovich Doinikov, Moscow Stomatological Institute; Anatoli Ivanovich Rybakov, Moscow Stomatological Institute, and Voyacheslov Ivanovich Karnitski, Omsk Institute, Siberia. Eight American dental representatives will make a similar tour of Russia June 3-25.

mack, John W. Knutson, Carlos H. Schott and Francis A. Arnold, Jr. Basil Cupis has been named an observer.

JOINT ACCREDITATION GROUP FOR LABORATORIES SUGGESTED

Representatives of the American Dental Association and the National Association of Dental Laboratories will recommend to their organizations the establishment of a national joint commission for accreditation of dental laboratories.

At a meeting May 6-7 in Chicago, these representatives formulated the recommendation and agreed upon a set of bylaws for the joint commission. The recommendation will be presented for approval to the policy-making bodies of the two groups.

The bylaws call for a nine-member board of commissioners to direct the affairs of the joint commission. Three members would be named by each of the two sponsoring groups, and the final three would be named by three dental associations or societies not yet designated.

The contemplated program would be partially financed by fees collected from dental laboratories applying for accreditation. The balance of the cost would be underwritten by the dental profession. Program standards and implementation were referred to a committee for further development.

Representing the American Dental Association at the joint meeting were: J. Eugene Ziegler, George H. Fitz, Harry M. Klenda, Gustave J. Perdigon, Worthington G. Schenk, Harold Hillenbrand, Walter E. Dundon, Shailer Peterson, Mr. Ben F. Miller, Mr. Eric M. Bishop and Mr. John P. Noone. Mr. Bernard J. Beazley attended as a consultant.

Representatives from the National Association of Dental Laboratories were: Mr. Homer Dickson, Mr. John F. Auderer Jr., Mr. Nathan Cooper, Mr. Horace J. Denner, Mr. Thomas McAndrews, Mr. Maurice Y. Nicole, Mr. Hoyt E. Cushman, Mr. Ralph D. Sanders, Mr. Don Neuenschwander, Mr. Markus Ring, Mr. G. Paul Stough, Mr. George Klein, Mr. Kelley E. Griffith and Mr. Paul A. Slone.

$25,000,000 DENTAL HEALTH FUNDS ASKED BY ASSOCIATION

In testimony delivered April 20, the American Dental Association asked Congress to vote $25,000,000 in dental health funds of the U.S. Public Health Service for the coming year.

Speaking before the health funds sub-

committee of the House appropriations committee, C. Gordon Watson, assistant secretary of the Association, asked that the National Institute of Dental Research receive $21,350,000 in the coming fiscal year and that a $2,000,000 increase be granted for the budget of the U.S. Public Health Service Division of Dental Health and Resources.

In the present fiscal year, $15,500,000 was available to these two agencies, $2,000,000 of which went to the Division of Dental Health and Resources.

In a statement filed with another subcommittee of the House appropriations committee, the American Dental Association announced support of the proposed 1962 budget appropriation request of the Office of Civil and Defense Mobilization which deals with the program of the Public Health Service Division of Health Mobilization.

THIRTY-SIX SOCIETIES FULFILL 1960-1961 RELIEF FUND GOALS

Thirty-six of the American Dental Association constituent societies and federal dental services have fulfilled their quotas in the 1961 relief fund campaign. The Association's campaign exceeded its goal on April 11 with $125,865 in contributions received, and on April 30 had reached a total of $126,668.07. Following is a breakdown of the fund campaign to the date of April 30, listing the societies and federal dental services, their quotas and contributions.

Constituent	Quota	Contribution
Alabama	$ 1,110.00	$ 1,110.50
Alaska	70.00	181.00
Arizona	530.00	683.00
Arkansas	710.00	829.00
California	5,120.00	5,668.00
Calif. So.	6,340.00	5,898.00
Colorado	1,320.00	1,561.50
Conn.	2,410.00	2,490.00
Delaware	210.00	269.00
Dist. of C.	850.00	1,493.00
Florida	2,160.00	2,557.00
Georgia	1,370.00	1,544.00
Hawaii	530.00	746.00
Idaho	380.00	387.00
Illinois	8,030.00	9,166.95
Indiana	2,670.00	2,635.00
Iowa	2,060.00	1,930.00
Kansas	1,200.00	1,226.65
Kentucky	1,470.00	1,585.89
Louisiana	1,290.00	1,304.00
Maine	510.00	671.00
Maryland	1,490.00	1,491.00
Mass.	4,370.00	4,746.00
Michigan	5,370.00	6,022.50
Minnesota	3,230.00	3,321.00
Mississippi	700.00	729.00
Missouri	2,810.00	2,678.00
Montana	440.00	423.00
Nebraska	1,130.00	1,062.00
Nevada	170.00	141.50
New Hamp.	370.00	241.00
New Jersey	5,000.00	5,131.65
New Mexico	340.00	334.50
New York	17,720.00	15,648.61
N. Car.	1,640.00	1,890.00
N. Dakota	360.00	485.00
Ohio	6,130.00	5,154.14
Oklahoma	1,120.00	1,217.40
Oregon	1,630.00	1,585.00
Panama	40.00	40.00
Penn.	$ 8,140.00	$ 6,910.50
Puerto Rico	300.00	227.00
Rhode Is.	640.00	936.00
S. Car.	580.00	571.50
S. Dak.	360.00	541.00
Tennessee	1,690.00	4,934.00
Texas	4,300.00	3,893.75
Utah	680.00	619.00
Vermont	220.00	273.00
Virginia	1,680.00	1,707.50
Washington	2,420.00	2,526.50
W. Va.	840.00	812.00
Wisconsin	3,340.00	2,568.75
Wyoming	210.00	238.00
Total	$119,800.00	$123,036.29
Fed. Dental Services		
Air Force	$ 1,270.00	$ 602.00
Army	1,150.00	601.50
Navy	1,550.00	850.50
P.H. Serv.	400.00	466.75

Constituent	Quota	Contribution
Vet. Admin.	830.00	336.50
Total	$ 5,200.00	$ 2,857.25

Summary

Constit. Societies	$119,800.00	$123,036.29
Fed. Dentl. Services	5,200.00	2,857.25
Students		558.03
Memorials		110.00
Miscellaneous		106.50
Total	$125,000.00	$126,668.07

HARVEY SARNER NAMED AIDE TO COUNCIL ON LEGISLATION

Mr. Harvey Sarner has been named assistant secretary of the Council on Legislation. He assumed his new duties May 15, succeeding Mr. Hal Christensen, who has been assigned to the Washington, D.C., office of the Association as Washington Counsel.

Mr. Sarner, who received his B.S.L. and LL.B. degrees from the University of Minnesota, was previously attorney-advisor in the office of the general counsel of the Federal Communications Commission. He also served four years on active duty with the U.S. Navy.

Dental Societies

NEW YORK SOCIETY INSTALLS ISIDORE TEICH AS SECRETARY

Isidore Teich was recently installed as full-time secretary and chief administrative officer of the First District Dental Society of New York. For the past six years as secretary, Dr. Teich supervised the society's operations on a part-time basis. To accept the new position he has retired from practice.

Dr. Teich served as president of the First District society in 1946 and is currently a member of the board of governors of the Dental Society of the State of New York and also a member of the board of directors of the Dental Service Corporation. He also is a member of the Judicial Council of the American Dental Association.

MICHIGAN SOCIETY APPROVES PREPAID DENTAL CARE PLAN

The Michigan State Dental Association approved in mid-April a new prepaid dental care plan to offer to business, industry, and labor groups. Floyd D. Ostrander, who will head the new Michigan Dental Service Corporation, said he anticipated that one or more prepaid dental care plans will be in operation within a few months.

At first, care will be limited to such procedures as fillings, extractions, periodontal treatment, roentgenograms and dentures. It will be a fee-for-service plan rather than an insurance-type operation and contracts will be between the Michigan society and interested groups.

Premiums will be based on utilization, Dr. Ostrander said. He estimated that the first year premium will be about $32.50 for each member of a group who receives dental care. This premium could

Winners in the Toledo Dental Society's annual contest to honor the most perfect teeth in northwestern Ohio are Kathy DeCant of Perrysburg and John Thomas of Toledo. They were awarded trophies at the Society's fortieth annual Clinic Day in April. Ralph H. Boos of Minneapolis was principal speaker at the clinic.

Presenting an honorary membership certificate in the Academy of General Dentistry to Rear Adm. Curtis W. Schantz (c.) is Capt. Charles Heck. Watching the presentation are (from l.) George A. Holmes, educational director of the Academy; T. V. Weclew, president; and A. L. Knab, secretary.

be reduced the second year as long-existing conditions are corrected.

According to the most recent surveys, there are now prepaid dental care plans covering 580,000 individuals. This is an increase of 40 per cent since 1958. The utilization range of prepaid dental care groups presently averages 50 to 60 per cent. In other words, if a group has 1,000 members, from 500 to 600 see a dentist within one year.

AMERICAN WOMEN DENTISTS MEET IN PHILADELPHIA

The Association of American Women Dentists will meet in Philadelphia, October 15-16, at the Warwick Hotel. Further information may be obtained from Mary DeRisi, chairman, publicity committee, 2849 29th Pl., N.W., Washington, D.C.

SOUTHERN N.J. DENTAL GROUP PRESENTS TESTIMONIAL AWARD

The Southern Dental Society of New Jersey recently presented Harry Capehart with a plaque memorializing "fifty years of service to the public and to the dental profession." It is the same award given to members of the profession.

Mr. Capehart recently retired as representative of S. S. White Dental Mfg. Co. His aid and advice to members of the society over a period of years prompted this gesture.

ARK-LA-TEX DENTAL GROUP TO MEET IN SHREVEPORT

The Ark-La-Tex Dental Congress will hold its ninth annual meeting at the Captain Shreve Hotel in Shreveport, La., August 21. Further information may be obtained from George Poulos, secretary-treasurer, 211 State National Bank Building, Texarkana, Ark.

Legislation

AGED HEALTH CARE BILL MAY NOT REACH VOTE THIS YEAR

President John F. Kennedy's bill to place health care for the aged under Social Security may not reach the floor of Congress this year. This possibility was strengthened by comments of President Kennedy at a recent news conference. Asked if he thought there would be a vote in both Houses of Congress, he replied, "I don't know. If we had a vote in the House it would depend, of course, on the action of the Ways and Means committee . . . It's possible there will be one in the Senate, which is not restricted by the same rules."

Congressional leaders' comments were

even more indefinite. For example, Congressman Wilbur Mills (D.-Ark.), chairman of the House Ways and Means committee, when asked if the legislation will be taken up, responded, "We certainly won't take up the bill soon, but I won't go beyond that prediction."

SELF-EMPLOYED TAX DEFERRAL BILL NEARS HOUSE PASSAGE

The Keogh Bill, which would permit self-employed persons to defer taxes on self-contributory retirement funds until the funds are actually in use, has been ordered reported to the House of Representatives by the House Ways and Means Committee. There is still sufficient time remaining in this first session of the Eighty-Sixth Congress for the bill to pass the House, and the Senate also may have time to act on this legislation before the session is concluded.

Hal M. Christensen (l.), Washington Counsel for the American Dental Association, visits with Congressman Eugene J. Keogh (D.-N.Y.), a strong supporter of Association legislative efforts and sponsor of H.R. 10, the tax saving retirement plan for self-employed persons. Shortly after Mr. Christensen's visit with Representative Keogh, the House Ways and Means Committee voted overwhelmingly in favor of sending the bill to the floor of the House for action.

The committee ordered the bill reported by an 18-5 vote. Congressman Eugene J. Keogh (D.-N.Y.), who introduced the bill, said, "The vote is indicative of the bipartisan support for this remedial legislation in the House . . . and I am confident that after ten long years of waiting H.R. 10 will be enacted into law."

Under the proposed legislation, the self-employed individual would be permitted to defer taxes on money placed in a pension fund up to $2,500 a year, or 10 per cent of his annual income, whichever is less. His contribution would be based on self-employment earnings rather than on total income.

The retirement funds could be invested in qualified pension trusts, annuity programs or profit-sharing plans. In addition, a new type of nontransferable government bond would be offered. It would be redeemable only when individuals reach qualifying age.

No benefits could be taken under the plan before the age of 59½, except in cases of disability, and benefits would have to begin before the age of 70.

Public Health

DENTAL DIRECTORS URGE PROMOTION OF FLUORIDATION

More vigorous promotion of water fluoridation was urged by the Association of State and Territorial Dental Directors meeting with the Children's Bureau and the Public Health Service, May 1-4.

The dental directors from 44 states also gave high priority to the development of criteria for use in planning dental care programs for the chronically ill and aged, and to the expansion of dental health education programs.

The following officers of the association were elected: President, Linwood G. Grace, director, Pennsylvania Bureau of Dental Health; president-elect, David

R. Wallace, New Jersey Coordinator of Dental Health; vice-president, Floyd H. DeCamp, director, Florida Bureau of Dental Health; and secretary-treasurer, E. Alec Pearson, director, North Carolina Division of Oral Hygiene.

M. K. HINE RE-ELECTED HEAD, INDIANA BOARD OF HEALTH

Maynard K. Hine, dean of Indiana University School of Dentistry and trustee of the Seventh District of the American Dental Association, has been re-elected chairman of the executive board of the Indiana State Board of Health.

DENTAL PUBLIC HEALTH EXAMINATION IN PHILADELPHIA

The next certifying examination of the American Board of Dental Public Health will be held October 12-13 in Philadelphia, just prior to the annual session of the American Dental Association. The Board has broadened its eligibility requirements to permit certification of dentists engaged in full-time teaching or research as well as in administration related to dental public health practice.

Applications for admission to the examination should be submitted to the Board not later than June 15. Information and application forms may be obtained from the secretary, Donald J. Galagan, U.S. Public Health Service, Washington 25, D.C.

Dental Education

DENTAL HEALTH EDUCATION COURSE IN SAN FRANCISCO

A special course in dental health education will be held at the University of California Extension Center, San Francisco, June 19-July 8. Presented by the extension division, in cooperation with the U. of C. Schools of Public Health and Dentistry, the College of Physicians and Surgeons, and the California Dental Association, the three-unit course will be coordinated by Robert E. Tumelty, director, Health Education Services, California Dental Association.

Further information may be obtained from the University of California Extension, University of California, Berkeley 4, Calif.

JOHN E. BUHLER RESIGNS AS DEAN, EMORY DENTAL SCHOOL

John E. Buhler has resigned effective June 5 as dean of Emory University School of Dentistry to accept a position as vice-president and general manager of the Hanau Engineering Company. He had been dean and professor of dentistry at Emory since 1948.

Dr. Buhler is succeeded by George H. Moulton who has been a member of the Emory faculty since 1955. Dr. Moulton was previously chairman and professor of crown and bridge dentistry and superintendent of the Emory clinics. He holds degrees from Gustavus Adolphus College and the University of Minnesota. Dr. Moulton also served 15 years in the U.S. Army, five of them as head of operative and crown and bridge departments at Walter Reed Hospital.

Dr. Buhler was graduated from Indiana University School of Dentistry in 1935 and served on that school's faculty until 1942 when he became an associate professor of oral surgery at Temple University School of Dentistry.

From 1946 until 1950, Dr. Buhler served as secretary-treasurer of the American Association of Dental Schools and was the association's president during 1954-1955. He was a member of the association's executive committee from 1946 to 1955 and since May 1960 has been vice-chairman of the Council on Dental Education of the American Dental Association.

Dr. Buhler currently holds the rank of

Frank J. Houghton, dean, Loyola University School of Dentistry, New Orleans, accepts $1,800 check on behalf of the school from Victor Marquer (r.), chairman, postgraduate study committee of the Loyola Dental Alumni Club, whose members made the donation. Frank Herbert, president, also took part in the presentation. The money will be used to provide new equipment for the roentgen-ray processing room of the radiology department in the School of Dentistry.

Dental Director (Colonel) in the U.S. Public Health Service Reserve and is a member of the following organizations: Northern District Dental Society of Georgia, Omicron Kappa Upsilon, Delta Sigma Delta, National Education Association, American College of Dentists (Fellow), American Association for the Advancement of Science, the board of directors of the Fund for Dental Education, Inc., Association of Military Surgeons of the U.S., and the Training Grants Committee of the National Institute of Dental Research.

DENTAL TEACHERS INSTITUTE SET FOR JUNE NINETEENTH

The third annual Institute for Dental Teachers will be held June 19-23 at the University of Illinois College of Dentistry in Chicago. Emphasis will be placed on methods of teaching motor skills and problems in dental instruction. The faculty will include educators in the fields of general education, social sciences, dentistry and medicine.

Further information may be obtained from Edward J. Forrest, associate dean and director of postgraduate education, University of Illinois College of Dentistry, 808 S. Wood St., Chicago.

DECEMBER EXAMINATION DATE FOR ORAL PATHOLOGY BOARD

The American Board of Oral Pathology will give its next certification examination December 9-10, 1961. Candidates will be notified of the place on being accepted for the examination. All applications must be completed by August 1, 1961. Information and application blanks may be obtained from the secretary, William G. Shafer, Indiana University School of Dentistry, 1121 W. Michigan St., Indianapolis 2.

DENTAL HYGIENE COURSE OFFERED AT MARQUETTE

The department of dental hygiene, Marquette University, and the dental division of the Wisconsin State Department of Health will present a ten-day, two credit institute for dental hygienists, July 10-28.

The course, covering the social aspects of dental hygiene, presents a practical

approach to dental health practices and is designed for the dental health educator teaching dental health practices and for the dental hygienist engaged in public health.

Further information may be obtained from Elizabeth M. Linn, chairman, Department of Dental Hygiene, 604 N. 16 St., Milwaukee 3.

DAVID F. STRIFFLER TO TEACH PUBLIC HEALTH DENTISTRY

David F. Striffler has accepted an appointment as associate professor of public health dentistry in the School of Public Health at the University of Michigan. He is resigning his position as director of the Division of Dental Health in the New Mexico Department of Public Health, which he has held since 1953.

Dr. Striffler has degrees from the University of Michigan's School of Dentistry and School of Public Health. He has served as chairman of the Public Health Dentistry Section of the American Dental Association, and for the last three years he has been secretary of the Dental Health Section of the American Public Health Association.

LAVERNE H. JACOB PRESENTED LOYOLA DENTAL ALUMNI AWARD

Laverne H. Jacob of Peoria, Ill., was recently presented with the annual Alumni Award of Loyola University's dental school during ceremonies in Chicago.

Dr. Jacob, a graduate of the Chicago College of Dental Surgery, Loyola University, served on the American Dental Association Board of Trustees from 1950 to 1956. He was chairman of the building committee during the construction of the $1,500,000 addition to the Association's Central Office in Chicago.

FOUR TEACHING FELLOWSHIPS AWARDED BY EDUCATION FUND

Four $6,000 teaching fellowships have been awarded by the Fund for Dental Education for the academic year 1961-62. The successful applicants are: Alden B. Chase, College of Medical Evangelists, Loma Linda, Calif.; Arthur A. Dugoni, College of Physicians and Surgeons, San Francisco; Karl K. Nishimura, University of Illinois College of Dentistry, Chicago, and Arthur T. Storey, Rackham School of Graduate Studies, University of Michigan, Ann Arbor.

Laverne H. Jacob (c.) is presented with the annual Alumni Award of Loyola University's dental school. With Dr. Jacob are William P. Schoen (l.) dean, Chicago College of Dental Surgery, Loyola University, and Frank Farrell, president, Loyola's Dental Alumni Association.

This year, fellowships available through the Fund have been increased from two to four. In the past the stipends offered ranged from $2,500 to $5,000, but the Board of Directors authorized raising all fellowships to $6,000 to make them comparable with other fellowships offered in dental teaching and research.

TEMPLE ALUMNI LUNCHEON TO HONOR GERALD D. TIMMONS

The Temple University Dental Alumni Society will give a luncheon in honor of Gerald D. Timmons, October 17, at the Union League Club in Philadelphia. The luncheon is open to all, but because of limited facilities tickets will be available on a first come, first served basis. The cost is $5 per person. Checks and reservations should be sent to Royal T. Popper, chairman, 5605 N. Park Ave., Philadelphia 41.

POSTGRADUATE COURSES DEAL WITH VARIED SUBJECT MATTER

Albert Einstein College of Medicine • The Department of Dentistry of the Albert Einstein College of Medicine of Yeshiva University will sponsor a five-day participation course in clinical periodontics, October 30-November 3. Emphasis will be placed on the integration of periodontics into the general dental practice. Tuition is $175. Course is under the direction of Irving Yudkoff and Marvin N. Okun. Applications may be obtained by writing the director, Postgraduate Dental Program, Albert Einstein College of Medicine, Eastchester Rd. and Morris Park Ave., Bronx 61, N.Y.

Boston • The Department of Stomatology, Division of Graduate Studies, School of Medicine, Boston University, and the Massachusetts Memorial Hospitals are offering four courses this November. They are: Occlusal adjustment, Oct. 30-Nov. 3, B. S. Chaikin, H. M. Goldman, G. M. Kramer, W. Pendergast, I. Romanow, J. D. Kohn, D. J. Baraban, L. Talkov, D. V. Berry, and J. Bloom, fee $200; periodontal therapy, Nov. 6-10, H. M. Goldman, B. S. Chaikin, G. M. Kramer, W. Pendergast, I. Romanow, J. Bloom and associates, fee $200; endodontics, Nov. 13-17, H. Schilder, fee $175; and fixed bridge prosthesis, Nov. 27-Dec. 1, L. Talkov, D. J. Baraban, L. Warshauer, fee $175. Further information may be obtained from David J. Baraban, Massachusetts Memorial Hospitals, 750 Harrison Ave., Boston 18.

Highland-Alameda Hospital • The Highland-Alameda County Hospital, Oakland, Calif., is offering a three-year internship and residency in oral surgery. An educational fund of $300 is available for second year residents to attend any scientific, educational meeting of his choice, with the approval of the chief of service. Stipends alloted to house staff are: Intern (12 months), $175 per month; first year resident (12 months), $220 per month, and second year resident (12 months), $255 per month. Applications may be secured by writing G. Otis Whitecotton, M.D., medical director, Alameda County Medical Institutions, 2701 14th Ave., Oakland 6, Calif.

Illinois • The University of Illinois College of Dentistry will offer a postgraduate course, current histology for the general practitioner, June 26-27. Tuition is $50. Applications are available from the Division of Postgraduate Education, University of Illinois College of Dentistry, 808 S. Wood St., Chicago 12.

Jewish Memorial Hospital • A one-year rotating internship, beginning July 1, 1961, is available at Jewish Memorial Hospital, New York City. The hospital provides room and board, uniforms, laundry, a stipend of $1,800 per year, and other fringe benefits. Further information may be obtained from Julius M. Goldberg, chief, Department of Dentistry, Jewish Memorial Hospital, Broadway at 196 St., New York 40.

Mount Sinai Hospital • The Mount Sinai Hospital of New York is offering a two-year residency in oral surgery. The residency is being presented in conjunction with the School of Dental and Oral Surgery, Columbia University. Information may be obtained from Alvin Nathan, director, Department of Dental and Oral Surgery, The Mount Sinai Hospital, Fifth Ave. and 100th St., New York 29.

The hospital is also offering two courses for the general practitioner: analgesia and pain control, and minor oral surgery for the general practitioner. Information may be had from Norman Cranin, Department of Dental and Oral Surgery, Mount Sinai Hospital.

Oregon • The University of Oregon Dental

School is offering a graduate program in oral pathology. It is a three-year program, the first year of which consists of resident-type training in general pathology at the University of Oregon Medical School. The following two years are taken under the direction of Norman H. Rickles and Robert J. Bruckner. Financial support is available through the teacher-training program of the U.S. Public Health Service, and a stipend will vary from $4,000 to $5,500 per year depending on individual circumstances. Inquiries should be addressed to Ellis B. Jump, chairman of the graduate committee, University of Oregon Dental School, 611 S.W. Campus Drive, Sam Jackson Park, Portland 1.

Temple • A one-day course in clinical endodontics will be presented October 20 by Temple University School of Dentistry, immediately following the annual meeting of the American Dental Association. The course will be under the direction of Leonard Parris. The fee, including luncheon, is $35. Further information may be obtained from Louis Herman, Temple University School of Dentistry, 3223 N. Broad St., Philadelphia 40.

Texas • The University of Texas Dental Branch will offer a course on diagnosis and treatment of temporomandibular joint disease June 22-23. This course will consist of a discussion of temporomandibular joint disease by Welden E. Bell, and is acceptable for 16 hours of credit by the Texas Academy of General Dentistry. Tuition is $75. Application forms may be obtained from Sumter Arnim, Director, Postgraduate School of Dentistry, 6516 John Freeman Ave., Houston 25.

Dean William H. Crawford (right), School of Dentistry, University of Minnesota, congratulates Robert A. Vickers on receipt of the first three-year Advanced Clinical Fellowship given to a dentist by the American Cancer Society.

Washington • The University of Washington School of Dentistry announces a graduate course in endodontics and microbiology leading to a master's degree in dentistry. The program, under the direction of John I. Ingle, is for two calendar years beginning September 1961. The trainee will receive a stipend of $5,300 a year from a National Institutes of Health Teacher Training Grant. His tuition and some additional expenses will be paid as well as allowances for travel to scientific meetings. Further information may be obtained from Saul Schluger, director, Graduate Dental Education, University of Washington, School of Dentistry, Seattle 5.

Research

$70,000 ANNUALLY GRANTED TO BALTIMORE HOSPITAL

The Children's Hospital in Baltimore has received a grant of $70,000 per year from the Children's Bureau, the Department of Health, Education, and Welfare, and the Maryland State Department of Health.

The money will be used to establish a demonstration project designed to meet the dental needs of handicapped patients. It is hoped that this program will serve as a model for similar projects. The program at Children's Hospital is under the direction of Burton R. Pollack and is being conducted in cooperation with the Department of Pediatrics at the Johns Hopkins Hospital.

SUPER-SPEED AIR-TURBINE DENTAL HANDPIECE DEVELOPED

A 260,000 rpm, air-bearing, air-turbine dental handpiece has been developed for the dental research branch of the School of Aviation Medicine, U.S. Air Force Aerospace Medical Center, Brooks Air Force Base, Texas.

The unit, which is the highest speed air-bearing handpiece yet built, marks completion of the halfway point in a pro-

The highest speed air-bearing, air-turbine dental handpiece yet built is shown disassembled. Turning at 260,000 rpm, the unit is incorporated in a dental handpiece designed and built for the dental research branch of the School of Aviation Medicine, U.S. Air Force Aerospace Medical Center, Brooks Air Force Base, Texas, by the Garrett Corp., AiResearch Manufacturing Division.

gram to build a similar unit with an even higher rpm. The dental unit was developed and built under contract to the Air Force Aerospace Medical Center in cooperation with Lt. Col. Jack L. Hartley, technical director for the program.

Extremely low vibration and noise levels are features of the new handpiece. According to studies conducted by Colonel Hartley, these factors contribute to less discomfort for dental patients and less fatigue for the dentist. The higher speeds require almost no pressure and reduce tooth contact time by 75 per cent.

The unit was manufactured by Garrett Corp., AiResearch Manufacturing Division.

General

MEDICAL SOCIETY, OTHERS, OFFER FLUORIDATION SUPPORT

The American Medical Association offered its assistance in the campaign for fluoridation of community water supplies in a telegram, April 14, on the occasion of the twelfth National Dental Health Conference in Chicago. Twenty-three other health and allied associations also sent their endorsements of the fluoridation program to Rulon W. Openshaw, chairman, Council on Dental Health, American Dental Association.

The telegram of the medical society, sent by F. J. L. Blasingame, M.D., executive vice-president of the American Medical Association, read in part: "We are gratified that the theme of your program, 'Action programs in dental health,' will be implemented by a major discussion of the need for public understanding and acceptance of fluoridation of communal water supplies as a highly desirable health measure.

"As you know, the American Medical

Mary Sue Wilson, 17, of Cedar Falls, Iowa, one of the current 40 Westinghouse Science Talent Search winners, discusses her latest award-winning science project with Seymour J. Kreshover (l.) associate director in charge of research, and Francis A. Arnold, Jr., director, National Institute of Dental Research. Miss Wilson's science projects in bacteriology have won her the American Dental Association award at the 1959 and 1960 National Science Fairs. She also won a citation from the Society of American Bacteriologists in 1959.

Association believes that fluoridation of public water supplies is a safe and practical method of reducing the incidence of dental caries from childhood into adulthood.

"We join you in urging the American people to accept fluoridation as a prophylactic measure for reducing tooth decay in communities where their water supply contains less than the equivalent of 1 ppm of fluorine.

"We are happy to offer you our assistance in developing community understanding of fluoridation as a significant contribution toward better health care."

Other groups which sent their endorsements of fluoridation were: American Academy of Pediatrics, American Association for the Advancement of Science, American Dental Hygienists' Association, American Federation of Labor and Congress of Industrial Organizations, American Hospital Association, American Legion, American Nurses' Association, American Pharmaceutical Association, American Public Health Association, American Public Welfare Association, American School Health Association, Association of State and Territorial Health Officers, Canadian Dental Association, Department of the Air Force, Department of the Army, Department of the Navy, the Public Health Service and the Food and Drug Administration of the Department of Health, Education, and Welfare, International Dental Federation, Indiana State Board of Health, Joint Committee on Health Problems in Education, National Academy of Sciences, and National Congress of Parents and Teachers.

DENTISTS-ARTISTS TO EXHIBIT WORKS OF ART AT MEETING

Works of art created by dentists will be exhibited during the thirteenth International Dental Congress of the Fédération Dentaire Internationale, July 7-14, 1962, in Cologne, Germany.

Works of painting, etching, sculpture, the applied arts and literature that have been created by dentists as a hobby, but not necessarily dealing with dental or scientific subjects, will be exhibited.

Regulations for participation in this exhibition may be obtained from Paul Jaeger, Nikolaistrasse 2, Munich 23, Germany. The type of artwork to be exhibited must be included in the request for information. Last date for application is July 30, 1961.

PRESIDENT KENNEDY, FAMILY DRINK FLUORIDATED WATER

President John F. Kennedy and his family drink fluoridated water provided by the District of Columbia public water system, according to a statement made by his personal physician, Janet Travell, M.D.

The statement was released as a refutation to some opponents of fluoridation who have said that the President and his family drink bottled water.

Dr. Travell's statement, issued from the White House, read: "The President and his family drink the water provided by the District of Columbia, which is fluoridated in accordance with the recommendation of the Public Health Service that communities adopt this measure as a means of improving dental health."

By drinking fluoridated water, President Kennedy is following the example set by his predecessor, Dwight D. Eisenhower.

BABIES AND BREADWINNERS POLIO VACCINATION CAMPAIGN

"Babies and breadwinners" will be the theme and target of the 1961 national polio vaccination program conducted by the Public Health Service. The Service believes the best way to prevent future polio epidemics is to obtain full innoculation where it counts most—in very young children and young parents—and will concentrate on promoting an in-

creased use of the Salk vaccine in these groups.

As paralytic polio in 1960 was concentrated in low income areas, both rural and urban, low income neighborhoods also will be a special target of the 1961 campaign.

FATHER OF DEAN H. ROBINSON DIES IN PENNSYLVANIA

William J. Robinson, 84, father of Dean H. B. G. Robinson of Kansas City University School of Dentistry, died April 8 in Clifton Heights, Pa. Dr. Robinson had been a dentist and dental surgeon in Philadelphia for more than 50 years.

He was graduated from the Philadelphia Dental College, now Temple University College of Dentistry, in 1904, and had been president of the following organizations: Philadelphia County Dental Society, Pennsylvania Association of Dental Surgeons, Pennsylvania State Dental Association, West Philadelphia Odontographic Society, and American Association for Cleft Palate Rehabilitation.

Dr. Robinson is survived by his son, Dean Robinson, and a daughter, Muriel, a public health dentist.

DENTAL CARE PLAN TO BENEFIT PHARMACEUTICAL EMPLOYEES

Astra Pharmaceutical Products, Inc., of Worcester, Mass., has introduced a group dental care insurance plan for its employees. The plan, which is underwritten by Union Mutual Life Insurance Co., was developed in cooperation with the Worcester Dental Society. It is designed not only to meet employee dental care costs, but also to provide statistical data on utilization, accumulated needs and types of services demanded.

Although the plan is similar to the plans underwritten by the Continental Casualty Co. for the Dentists' Supply Co. of New York and the Kerr Manufacturing Co., there are differences in their maximum benefits and administration.

William W. Hurst (l.), newly elected president, American Equilibration Society, presents the "Founder's Gavel" to Victor H. Sears at the society's recent annual meeting in Chicago. The gavel, made of cocabola wood, is inscribed: Victor H. Sears, D.D.S. Founder and First President 1956 - 57—1957 - 58.

These differences will enable the plan to be evaluated on its own merits, thus contributing to the development of reliable data on which other dental care insurance plans can be based.

SKELETON FOUND IN THAMES BELIEVED THAT OF AMY JOHNSON

American dentists have been asked to help in establishing the identity of a skeleton believed to be that of Amy Johnson, the famous flyer who drowned January 1941 in England. Miss Johnson (married name, Mrs. James Mollison) was on a flight across England when dense fog forced her to parachute. She fell into the Thames estuary and was drowned. Her body was not recovered.

Recently, some human bones, including a mandible in good condition, were found near this location and shown to be those of a woman around 35 years old. The number of missing teeth in the mandible correspond to the number of artificial teeth on the dental appliance Miss Johnson wore during her life.

According to Miss Johnson's father,

she had fairly extensive dental work done in New York prior to World War II and perhaps in the 1930's.

Dentists having records dating that far back are asked to check them to determine whether they ever did dental work for Miss Johnson (or Mrs. Mollison). Any information regarding this subject should be sent to the Office of the Editor of the American Dental Association and to Dr. H. C. Purcer Smith, Narradale, 98 Bramhall Lane South, Bramhall, Cheshire, England.

WELLINGTON NAMED SECRETARY OF DENTAL TRADE ASSOCIATION

Mr. Edmund Wellington, Jr., has been named executive secretary of the American Dental Trade Association, according to Mr. Henry M. Thornton, president of the association.

Edmund Wellington, Jr.

Mr. Wellington succeeds Mr. Wilmoth C. Mack, who resigned to become president of the S. S. White Dental Manufacturing Company. Mr. Wellington previously was staff director of the Military Products Division of Electronic Industries Association. He also has been assistant to the executive director, National Federation of Textiles, Inc., and served as vice-consul of the American Consulate in Hanoi, Vietnam.

An Army Air Force veteran, Mr. Wellington was graduated from the University of Florida in 1948 and later took graduate work at Georgetown University.

ENDODONTISTS ENDORSE STANDARDS ON THERAPEUTICS

The American Association of Endodontists research committee report includes resolutions accepting the findings of the Council on Dental Therapeutics. These resolutions read: ". . . that the American Association of Endodontists discountenances chemical agents and medicaments for use in endodontic treatment which have not been accepted by the Council on Dental Therapeutics of the American Dental Association. Be it further resolved that medicaments of this kind be excluded from commercial exhibits at A.D.A. meetings or its constituent societies."

PETER G. MEEK APPOINTED HEALTH COUNCIL DIRECTOR

Peter G. Meek has been appointed executive director of the National Health Council, effective August 1, 1961. Mr. Meek has been serving as the director of the New York Office and Northeast Regional Representative of the National Society for Crippled Children and Adults since 1956. Mr. Levitte Mendel will serve as acting executive director until Mr. Meek assumes his duties.

VAN CLIBURN CONCERT DURING PHILADELPHIA CONVENTION

Pianist Van Cliburn will play with the Philadelphia Orchestra under the direction of Eugene Ormandy, October 16, during the American Dental Association's annual session in Philadelphia.

Van Cliburn will perform this one night only as a benefit for the Children's Hospital and those who would like to attend are urged to send for tickets as soon as possible.

Part of the ticket cost is a contribution to the benefit, and this portion is tax deductible. Seat prices are: Balcony $8.00 ($3.00 contribution included), family

circle $5.00 ($1.75 included), amphitheatre $2.50 ($.50 included).

Tickets may be obtained from Mrs. Edw. J. MacMullan, Rittenhouse Plaza, Apt. 9B, Philadelphia 3.

CATHOLICS TO HOLD BREAKFAST AT PHILADELPHIA CONVENTION

Catholic dentists and their families have been invited to attend the first annual Communion Breakfast to be held October 15 in Philadelphia, during the annual session of the American Dental Association.

The breakfast, sponsored by the Greater Philadelphia Guild of St. Apollonia, will be held in the Sheraton Hotel's Hall of Flags. Prior to the breakfast, a nine o'clock Mass will be celebrated at the Cathedral of Saints Peter and Paul, 18 St. and the Parkway, for all participants.

Further information may be obtained from Waldo G. Gamba, 2311 S. 21 St., Philadelphia 45.

NEW A.D.A. BOOKLET AVAILABLE, 'YOU CAN PREVENT DECAY'

"You can prevent tooth decay," a new booklet prepared by the Bureau of Dental Health Education, stresses that teeth are meant to last a lifetime and will if they are given proper care. It is illustrated with line drawings and has sections on toothbrushing, diet and tooth decay, dental checkups and fluoridation. Prices for the booklet are: (25) $1.45, (50) $2.40, (100) $4.00, (500) $18.75. They may be obtained from the order department, American Dental Association, 222 E. Superior St., Chicago 11.

KOREA SCHOOL NEEDS DENTAL TEXTBOOKS

A gift of American dental textbooks was presented recently to the Dental College, Seoul (Korea) National University, on behalf of the Eighth Army Dental Corps. While stationed in Korea, Capt. David H. Gordy discovered few current texts in the library of that country's only dental school, and he arranged for the gift with the W. B. Saunders and C. V. Mosby publishing companies.

Captain Gordy requests that anyone having dental textbooks no longer needed send them to the Librarian, Dental College, Seoul National University, 111 Sogong dong, chong-ku, Seoul, Korea.

George Hollenback (r.) presents a plaque to the National Bureau of Standards, honoring Wilmer Souder (c.), first dental study section chief of the Bureau. W. T. Sweeney (l.), present chief of the section, accepted the plaque on behalf of the Bureau. The gift was presented in the name of the Dental Materials Group of the I.A.D.R. during the thirty-ninth general meeting of the International Association for Dental Research, March 23-26, Boston.

RUSSIAN JOURNAL TO BE AVAILABLE IN ENGLISH

The Russian journal, *Stomatology,* will be published in English as a cover-to-cover translation by the Helion Press in London. *Stomatology* will appear once every two months and will follow the U.S.S.R. edition by approximately one month. It will contain illustrations and consist of about 100 pages per issue. Subscriptions may be ordered from the Helion Press, 40 Crawford St., London W.1, England. Price is $27.30 per year.

international dentistry

News from Great Britain

British Dental Association • The Representative Board on March 4 passed the following resolution:

"That Her Majesty's Government be informed that the Representative Board of the British Dental Association accepts the Recommendations of the Royal Commission on Doctors' and Dentists' Remuneration."

This followed a series of local meetings of the Branches which, by a total vote of 2,805 for, to 762 against, more or less influenced the General Dental Services Committee to pass the following resolution:

"That taking into account the results of local meetings held to consider the Government's offer of a package deal in regard to the Report of the Royal Commission, the General Dental Services Committee reluctantly recommends the Representative Board to accept the Report of the Royal Commission as a whole as it stands." The Board apparently decided that acceptance was the only realistic course.

Dental Health Education • An editorial in the November issue of the *British Dental Journal* discusses the desire of the Representative Board to investigate the possibilities of a Bureau of Dental Health Education and includes the following.

"Reduction of the incidence of dental disease requires the education of the public in diet and oral hygiene. Valuable work has been done in this field by the Dental Board, the General Dental Council, the Oral Hygiene Service, and some local authorities as well as by individual practitioners. However, what is needed today is the collation of the experience gained, the pooling of ideas, recruitment of further agencies, and cooperation in the planning of future endeavours.

"To be successful, education must not only be interesting and continuous, it must also have authority. Dental Health education could have no better authority than the dental profession itself. These are the reasons for the proposal to establish a bureau of dental health education within the Association."

In this connection W. Stewart Ross, chairman of the Dental Health Committee of the British Dental Association, has stated that the Wolfson Foundation has denoted £5,000 to be placed at the disposal of such a bureau if established.

David Finlayson Writes That: The recent interim report of the Scottish Standing Committee on Dental Health Education has been well received and given favorable publicity. The Committee, before issuing its report, invited the Dundee Corporation to carry out a pilot study to assess the value of a dental health education campaign. The Corporation gladly accepted the invitation and in cooperation with the Department of Health for Scotland set up two committees: an advisory committee and a scientific committee.

What does the campaign mean? It means at least two things. First, there is the campaign itself with six months of publicity by the press, television, radio, and films, and the marking and checking of the dental cards issued to 20,000 children in primary schools showing that each has brushed his or her teeth each day. Twenty thousand "Happy Smile" badges have been issued and hundreds of banners and posters were shown throughout the city. The city centre had "the largest toothbrush in the world." The mobile clinic was on view in the City Square for three week-ends at the beginning of the campaign and was visited by a large number of interested parents and children who were given a short demonstration of toothbrushing. There are also parties to be given to the class in each of three areas of the city who show that they have most faithfully carried out the rules of caring for their teeth.

Films, followed by some advice by the dental officers, have been well received in every school and we hope to continue these in the next stage of the campaign.

The second, but unseen, part of the campaign is to assess its value. A campaign such as this differs from a roentgen-ray campaign where the number having roentgenograms taken can be totaled and the success measured each day. We are measuring the success of this oral hygiene campaign by studying 1,200 selected children, aged five to six years old, who present a cross-section of social grades. In these children, we are carrying out a careful dental examination of oral hygiene, classifying the condition of the teeth and noting the depth of the cavities and the state of the tooth

surfaces involved. A note is also made of the amounts of sweets and fruits consumed weekly, and the age and date of the child's school entry.

The health visitors called at the homes of 1,000 of the 1,200 selected children to enquire about their oral hygiene and eating habits. Two hundred homes were omitted in order that we may find the difference, if any, between the children whose homes were visited and those whose homes were not.

At the close of the publicity period, the end of March, the dental officers will carry out a second examination on similar lines to the first and compare the findings. It is also our intention to examine the selected group each year for a period of seven or eight years to find (1) the trend of caries and (2) the lasting effect of the campaign.

It has been shown, however, that dental health education requires to be put forward with vigor and on a large scale if it is to make progress, and that it is possible for the various interested bodies to cooperate satisfactorily.

New National Health Service Bill • The Government is to impose new charges in regard to the Health Service. So far as the dental profession is concerned, charges for dentures are to be slightly increased, but, in future, children and expectant and nursing mothers will be relieved of the present charges for dentures. Charges for corrective dental treatment will not be raised. The charge for prescriptions is raised from one to two shillings.

The British Dental Association has informed members of Parliament of its attitude to the new National Health Service Bill, 1961, in a special letter from the secretary which was sent to members of the committee which considered the Bill in detail last February.

When the Minister announced the introduction of new charges the Association immediately circulated to all newspapers and news agencies the following statement:

"The fact that the public will have to pay more for dentures under the new Bill does not mean that dentists will receive higher fees. The increase is imposed by the Government to reduce the Ministry of Health's share of the cost of dentures. In so far as the abolition of charges on dentures for children and expectant and nursing mothers is concerned, this is a reform which is long overdue and one for which the Association has been pressing ever since these charges were introduced in 1951."

Radiological Hazards • A second report has been issued by the government appointed committee set up to review "Radiological hazards to patients" and this confirms the first report in that the following conclusion is reached.

"We do not believe that the levels indicated show any need for major restrictions in radiological practice and we are convinced that the number and type of examinations or treatments must be dictated by the clinical needs of the patient."

The committee found no evidence warranting the curtailment of the use of roentgen rays in dentistry for diagnostic purposes, but in view of the potential danger of roentgen rays they must be used with discretion.

The Adrian Report says "Our survey has also shown that in the present circumstances the dose to the gonads from any x-ray examination is small in comparison with that considered by the Medical Research Council to be acceptable to the individual without causing any undue concern on behalf of himself or his offspring. The dose will be reduced further by the adoption of our recommendations."

The recommendations for diagnostic roentgenography are that there shall be adequate purpose for roentgen-ray examination; the technic should limit the area irradiated to that which is necessary; that whenever possible the beam should not be directed toward the gonads; films of the highest speed consistent with satisfactory diagnostic value should be used; and fluoroscopy should be avoided when possible.

The British Society for the Study of Prosthetic Dentistry • The society held a most interesting meeting in Edinburgh at the end of March when Prof. Björn Hedegard of Stockholm and Dr. Niels Brill of Copenhagen read papers.

British Dental Journal • An original communication in the February issue by Emslie, Veall and Duckworth on "Chewing gum as a vehicle for the administration of fluoride" is a very interesting and useful addition to our knowledge of the uptake of fluorine by the teeth.

Hospital Digest • The first issue of a monthly journal surveying world literature relating to hospitals was published on January 2, under the title *Hospital Abstracts*. This new series is based on the many periodicals, books, reports and other material published in various countries on matters relating to hospitals and hospital services (excluding strictly medical and related professional matters) and which are available in the Ministry of Health library. Each issue will contain about 150 summaries or notices in English of periodical articles,

books, and other publications from all parts of the world.

Royal College of Surgeons • At a meeting of the Council on February 9, 1961, Joseph Volker, dean of the University of Alabama School of Dentistry, was elected to the Fellowship in Dental Surgery.

G. H. Leatherman, D.M.D., F.D.S., R.C.S., F.A.C.D.

News from Argentina

University Census in the College of Dentistry • The results of the census conducted two years ago in the University of Buenos Aires are now available. The students replied to 58 questions and the data were computed electronically. The total university population in 1958 was 58,684. There were 3,485 dental students (1,913 men and 1,572 women). This is 5.9 per cent of the total student body. The majority of the students ranged in age from 18 to 24 years. Foreign students made up 8 per cent of the total (157 Latin Americans and 103 Europeans and North Americans). The majority, 67 per cent, were born in Buenos Aires or in the greater Buenos Aires area which has a total population of 7,600,000. Only 16 per cent of the students came from neighboring provinces. Ninety-two per cent were single. Two hundred and seventy-four claimed to know English, 154 French and 31 German. Many of the students worked while in school. Eleven per cent were employed in public administration work; 5 per cent in commercial occupations; 6 per cent were teachers; 0.7 per cent belonged to the armed forces and 0.3 per cent did some kind of manual labor (a total of 12 students). There were 32 per cent who devoted all their time to study and the rest were employed part-time outside the college.

In 1960, the university body had grown to 73,093. However, the dental student body was reduced from the previous 3,485 to 3,286.

News from Chile

JOHN W. KNUTSON VISITS CHILE'S HEALTH SERVICE FACILITIES

John W. Knutson, Chief Dental Officer of the U.S. Public Health Service, visited clinics and health centers of the National Health Service of Chile, April 13-15. He met with G. Fricke, executive director of the service, and Alfredo L. Bravo, vice-director, and was received by the Colegio de Dentistas de Chile and the Sociedad Odontologica of Santiago. He was named an honorary member of the Sociedad.

Dr. Knutson also was invited to dinner by the Dental University Club of Santiago. This club would like to receive other dentists who will be traveling in Chile and requests that the names of such dentists be sent to Manuel E. Moreno, Dental University Club of Santiago, Santiago, Chile. *Raul Muñoz Inza.*

International News in General

ALBERTA MECHANICS TO MAKE DENTURES FOR THE PUBLIC

Dental mechanics in Alberta, Canada, have been permitted by new legislation to take impressions, manufacture and fit dentures for the public starting July 1, 1961. A certificate of oral health signed by a dentist or physician is required before a mechanic can do his work.

By a vote of 36-25, the Alberta legislature approved a bill incorporating the Alberta Certified Dental Mechanics' Society. The legislation was introduced as a private member's bill to incorporate the Alberta Public Denturists' Society. After strenuous debate, the private bills committee approved the bill but agreed to change the name to dental mechanics. The committee also agreed that the society comes under the jurisdiction of the provincial labour department rather than the health department.

AUSTRALIAN DENTAL CONGRESS WILL BE HELD IN AUGUST IN SYDNEY

The sixteenth Australian Dental Congress will be held in Sydney, August 14-18. Speakers on the scientific program will include O. B. Coomer, D. J. F. Aubertine, and R. Gordon Agnew from the United States, in addition to speakers from other countries. A descriptive brochure of the congress is available from the Congress Office, 185, Elizabeth St., Sydney, N.S.W., Australia.

GERMAN MAXILLOFACIAL SURGERY GROUP PLANS JULY SESSION

The German Society of Maxillofacial Surgery (Deutsche Gesselschaft für Kiefer — und Gesichteschirurgie) will hold its eleventh session, July 24-26, 1961, in Stuttgart, Germany. The main topic will be "The surgical treatment of radiation damages in the maxillofacial region."

Further information may be obtained from Prof. Dr. Dr. Rehrmann, secretary, Westdeutsche Kieferklinik, Himmelgeisterstrasse 152, Düsseldorf, Germany.

ARMED FORCES DENTAL GROUP TO MEET IN HELSINKI

The Armed Forces Dental Services Commission will hold a meeting July 8-14, 1961, in Helsinki, Finland, in conjunction with the annual session of the Fédération Dentaire Internationale.

Included in the program will be an international conference on military dentistry which will feature the military dental record. Speakers will be Maj. Veikko Valtonen, director, Finnish Military Dental Services; Brig. K. M. Baird, director general, Dental Services, Canadian Forces; Rear Adm. C. W. Schantz, chief, Dental Corps, U.S. Navy, and Lt. H. H. Fortuin, Dental Corps, Royal Netherlands Navy.

Cmdr. J. Hoekstra, 28 Dovenetelweg, The Hague, Netherlands, requests the names of dental officers, active or reserve, who are going to Helsinki, so that invitations to the meeting may be extended to them.

ASIAN-PACIFIC DENTAL CONGRESS TO MEET IN TOKYO IN OCTOBER

The third Asian-Pacific Dental Congress will be held in Tokyo, Japan, October 17-22, 1961. The Japan Dental Association will be the host. Included in the meeting will be scientific sessions, commercial exhibits, business meetings, and sightseeing tours to Kamakura and Enoshima. Further information may be obtained from Hiroshi Kawamura, president, or Keizo Hosegawa, chief, Council on International Relations, Japan Dental Association, 4 Chome, Kudan, Chiyodaku, Tokyo, Japan.

AUSTRIAN DENTAL JOURNAL UNDER NEW MANAGEMENT

The Austrian Dental Association (Bundesfachgruppe für Zahnheilkunde) of the Austrian Medical Association (der Österreichischen Ärztekammer) assumed the responsibility for the administration and the publication of the *Österreichische Zeitschrift für Stomatologie* starting with the January-February 1961 issue. This magazine, first published 58 years ago, is now the only professional dental journal published in Austria.

REGISTER NOW FOR JULY FAUCHARD CELEBRATION IN PARIS

Colleagues planning to attend the bicentenary celebration of the death of Pierre Fauchard, July 1-2, 1961, in Paris, are urged to inform General Secretary Max Filderman as soon as possible.

The celebration will include the issuance of a memorial stamp of the "father of modern dentistry" by the French government, the placement of a bust of Fauchard, a memorial session at the Sorbonne, and publication of a new facsimile edition of Fauchard's *le Chirurgien Dentiste*.

The general secretary may be addressed at 67, Rue de Tocqueville, Paris XVII^{e}.

John W. Knutson, Chief Dental Officer, U.S. Public Health Service, confers with executives of the National Health Service of Chile during a recent visit to that country. From left: G. Fricke, executive director; Dr. Knutson; Alfredo L. Bravo, vice-director, and Raul Muñoz, dental assistant.

Association staff members: your national servants

Peter C. Goulding

Perry J. Sandell

DIRECTOR, BUREAU OF PUBLIC INFORMATION

Peter C. Goulding joined the staff of the Association in 1950, in the Bureau of Public Information. In 1956, he was appointed secretary of the Council on Scientific Session. In 1958 he assumed the duties of secretary of the centennial staff committee, and in May 1960 was appointed director of the Bureau of Public Information.

Born in Chicago, Mr. Goulding served in the Naval Air Corps in World War II. He graduated from De Paul University in 1950, with a B.A. degree. He is a member of the Public Relations Society of America, the Science Writers of America, and the Publicity Club of Chicago. Mr. Goulding is a former editor and officer of the Christian Family Movement in Chicago, and a former member of the board of directors of the Catholic Council on Working Life. He is also a member of the Citizens Consulting Committee to the Oak Park Board of Education. He is married and the father of five children.

DIRECTOR, BUREAU OF DENTAL HEALTH EDUCATION

Perry J. Sandell joined the staff of the Association in 1952 as director of the Bureau of Dental Health Education. The Bureau is responsible for developing and maintaining a program of dental health education for the Association, and for assisting constituent societies and other agencies in developing effective programs. The Bureau annually prepares and publishes more than one million copies of pamphlets, posters and other educational items for public distribution. The Bureau produces films for the education of the public in dental health. The Bureau also develops and distributes planning and promotional material for National Children's Dental Health Week, held in early February each year.

Mr. Sandell received both Bachelor and Master degrees from the University of Minnesota. He served in the Coast Guard for three and a half years during World War II. Prior to joining the Association staff, Mr. Sandell served for six years as director of health, physical education, recreation and safety with the Minnesota State Department of Education in St. Paul. Earlier, he had taught school for nine years in Minnesota and North Dakota.

Mr. Sandell represents the Association on the school health section council of the American Public Health Association, the health education division executive council of the American Association for Health, Physical Education and Recreation, and the committee on health education of the National Health Council.

Mr. Sandell is a member of the American School Health Association; American Public Health Association; American Association for Health, Physical Education and Recreation; Society of State Directors of Health, Physical Education and Recreation, and the Illinois Society of Public Health Educators. He is married and the father of two daughters.

DIRECTOR, BUREAU OF MEMBERSHIP RECORDS

Mrs. Georgia Christman began her career with the Association in 1955 as supervisor of the Department of Membership Records. With the growth of the Association, the department attained Bureau status by amendment of the bylaws in 1958, and Mrs. Christman was appointed director.

Georgia Christman

The primary function of the Bureau is the maintenance of the membership records of the Association and the biographical records of all dentists in the United States. In addition, the Bureau provides services for the maintenance and recruitment of membership. The Bureau also compiles the annual *American Dental Directory,* an official publication of the Association.

Mrs. Christman arranges and operates the registration of attendance at the annual sessions of the Association.

She is a native Chicagoan. From 1945 to 1955 she headed the department of survey and report writing for George Fry & Associates, management consultants.

DIRECTOR, BUREAU OF ECONOMIC RESEARCH AND STATISTICS

B. Duane Moen joined the Association staff as assistant director, Bureau of Economic Research and Statistics in 1949, the year in which the Bureau was activated as the successor agency to the Committee on Economics created in 1935. In 1950, Mr. Moen became director of the Bureau. In 1949 he received a Master's degree in educational psychology and statistics at the University of Minnesota. He served for four years in the Air Force in World War II and was a historical officer in the South Pacific.

The responsibilities of the Bureau of Economic Research and Statistics are to collect, compile, develop, analyze and disseminate data and statistics that concern the dental profession. The Bureau's studies and surveys provide basic information which has been helpful to Association agencies, governmental departments and private groups in planning and operating dental health programs. The studies of the Bureau are concerned chiefly with dental personnel, dental practice, the needs for dental care, and the attitudes, beliefs and practices of the general population relating to dental health.

Mr. Moen is a member of the American Statistical Association. In 1959 he received an award of merit from the American College of Dentists.

ASSISTANT DIRECTOR, BUREAU OF ECONOMIC RESEARCH AND STATISTICS

George Y. Ogawa joined the Association staff in 1956 as statistician, Bureau of Economic Research and Statistics, and in 1958 was appointed assistant director of that bureau.

He attended the University of Washington in 1941 and 1942, and attended Roosevelt College in Chicago from 1947 to 1949, receiving a B.A. degree in economics in 1949. From 1949 to 1952 he attended the University of Chicago, and received an M.A. degree in economics from that university in 1954.

From 1951 to 1956 he worked successively as research assistant, research associate and senior research associate at the Attitude Research and Development Project, Industrial Relations Center, University of Chicago. He is coauthor of *Dealer Attitude Inventory* and *Sales Employee Attitude Inventory,* both published by the Industrial Relations Center of the University of Chicago.

B. D. Moen

George Ogawa

reports of councils and bureaus

Current Relief Fund campaign exceeds its goal

COUNCIL ON RELIEF

Following the 1903 San Francisco earthquake the American Dental Association Relief Fund was established. Dentists across the nation responded generously in helping their colleagues in the San Francisco area to rebuild the offices and homes lost during the earthquake. Well over one million dollars in the form of regular monthly payments has been given to help dentists and members of their families who have suffered distress since this time. This aid has been made possible by generous contributions to the Relief Fund.

Over the past nine years, the yearly national goal for the Relief Fund has been exceeded. The Council on Relief is pleased to report that the 1960-1961 Campaign as of April 15 had again exceeded its goal of $125,000. The chairman of the Council, H. Robert Bleier, of Milwaukee, states that: "When one of our colleagues is completely disabled because of an accident or serious illness, we cannot wait to find funds to aid him. In order to have these funds immediately available, we ask that all dentists this year and each succeeding year give more."

Last year, 134 persons ranging in age from 25 to 93 received assistance from the Relief Fund. More than 100 were 61 years of age or older and all were disabled and unable to support themselves. Included among those given help were 20 widows of dentists. Most of the remainder were younger dentists, incapacitated for longer or shorter periods by catastrophic illness or accident. The average length of grant based on a survey made of all grants during 1960 was two years, while 28 dentists have been given assistance for five years or more.

One important aspect of the Relief Fund is the fact that all monies contributed are used strictly for relief purposes. The costs of administration of the Fund and of the fund-raising drive, which during 1960 amounted to approximately $20,000, are assumed by the Association. The 1959-1960 campaign goal of $100,000 was oversubscribed by $14,136. One half of the amount contributed to the annual campaign by members of

a constituent society is returned to that society for its local fund. In 1960, $66,337 was refunded to the constituent societies. All monies retained by the Relief Fund are invested and only the income from the investment may be used for relief purposes. Last year, the American Dental Association Relief Fund received $73,499 in income from investments and paid out as its share in grants $66,364 leaving a balance of only $7,135 for emergencies.

It is only through continued support of all members of the American Dental Association that assistance to fellow practitioners is possible.

Additions to the Library

BUREAU OF LIBRARY AND INDEXING SERVICE

The books listed here have been added recently to the Bureau collection. Requests for this material, available on loan to all members of the Association, should be addressed to the Bureau of Library and Indexing Service. There is no charge for borrowing books, but there is a minimal charge of one dollar for each package library. Practically all the dental journals published in the world at present are available to members on loan. Lists of books and package libraries are available on request.

BOOKS

AMERICAN COUNCIL ON EDUCATION. COMMISSION ON THE SURVEY OF DENTISTRY IN THE UNITED STATES. The survey of dentistry; the final report. B. S. Hollinshead, Director. Washington, 1960. 603 p. $10.

AMERICAN DENTAL ASSOCIATION. BUREAU OF LIBRARY AND INDEXING SERVICE. Index to dental literature in the English language, 1960. Chicago, 1961. 307 p. $10.

ANDRÉ-BONNET, J. L. Histoire générale de la chirurgie dentaire. Lyons, Éditions du Fleuve, 1955. 252 p. $30. Gift of Dr. A. H. Merritt.

ASH, M. M. A handbook of differential oral diagnosis. (The postgraduate dental lecture series.) St. Louis, Mosby, 1961. 234 p. $6.50.

BECKMAN, HARRY. Pharmacology; the nature, action and use of drugs. 2d ed. Philadelphia, Saunders, 1961. 805 p. $15.50.

BETHMANN, WOLFGANG. Tropenerfahrungen in plastischer Gesichts- und Kieferchirurgie; Bericht über eine einjährige Tätigkeit in Vietnam. Berlin, Volk und Gesundheit, 1960. 212 p. DM43.10.

BHASKAR, S. N. Synopsis of oral pathology. St. Louis, Mosby, 1961. 502 p. $9.75.

BREWER, A. A. & HUDSON, D. C. Application of miniaturized electronic devices to the study of tooth contact in complete dentures. Brooks AFB, Texas, Aerospace Medical Center, 1960. 9 p.

BYRNE, BROOKE. Mending books is fun. Minneapolis, Burgess, 1956. 162 p. $3.75.

CATTONI, MARTIN. Diagnosis of pulpal and periapical pathosis. (*Practical dental monographs,* March 1961.) Chicago, Year Book Publishers, 1961. 48 p.

DENTAL CLINICS OF NORTH AMERICA, March, 1961. Symposium on practice administration. Philadelphia, Saunders, 1961. 228 p.

GREENE, CARLA. I want to be a dentist. Pictures by Irma Wilde. Chicago, Childrens Press, 1960. 28 p. $2.

HINE, M. K., ed. Review of dentistry; questions and answers. 3d ed. St. Louis, Mosby, 1961. 576 p. $9.

INTERNATIONAL CONVENTION ON MISSIONARY MEDICINE IN REVIEW, Wheaton, Ill., 1959. Oak Park, Ill., Christian Medical Society,

1960. 158 p. (Includes dentistry section)

INTERNATIONAL SOCIETY OF PLASTIC SURGEONS. Transactions of the second congress, London 1959. Edinburgh, Livingstone, 1960. 589 p. $19.50.

JACOBY, HANS. Veränderungen der Zunge in der Diagnostik des praktischen Arztes; ein Leitfaden der Zungensymptomatik. Stuttgart, Schattauer, 1960. 156 p.

JAMISON, H. C. Prevalence and severity of periodontal disease in a sample of a population. (D. P. H. thesis—University of Michigan.) Ann Arbor, 1960. 153 p. Mimeo.

JARMER, KARL, ed. Physikalische Therapie in der Stomatologie. Berlin, Volk und Gesundheit, 1960. 232 p. DM30.50.

KEENE, M. F. L. & WHILLIS, J. Anatomy for dental students. London, Arnold, 1950. 342 p.

KENNEDY, A. C. Essentials of medicine for dental students. Edinburgh, Livingstone, 1960. 272 p. $5.

LEVISON, HENRY. Textbook for dental nurses. Oxford, Blackwell, 1960. 140 p.

LUNDSTRÖM, ANDERS, ed. Introduction to orthodontics. New York, McGraw-Hill, 1960. 315 p. $15.

MEARES, AINSLIE. A system of medical hypnosis. Philadelphia, Saunders, 1960. 484 p. $10.

MICHIGAN HEALTH COUNCIL. Donna and Dave explore a career. East Lansing, 1960. 6 p.

MORE, D. M. The dental student. (Reprinted from *Journal of the American College of Dentists,* March, 1961.) St. Louis, 1961. 93 p.

MORRANT, G. A. & STEPHENS, R. R. The development and application of modern methods in cavity preparation. London, British Dental Association, [1960] 78 p. 5s. Originally published in *British Dental Journal,* Vol. 109, 1960.

NATIONAL RESEARCH COUNCIL. SUBCOMMITTEE ON HEMATOLOGIC EFFECTS. Effects of ionizing radiation on the human hemapoietic system; report. (Publication 875.) Washington, 1961. 14 p.

NATIONAL RESEARCH COUNCIL. SUBCOMMITTEE ON INHALATION HAZARDS. Effects of inhaled radioactive particles; report. (Publication 848.) Washington, 1961. 78 p.

NATIONAL RESEARCH COUNCIL. SUBCOMMITTEE ON LONG-TERM EFFECTS OF IONIZING RADIATIONS FROM EXTERNAL SOURCES. Report. (Publication 849.) Washington, 1961. 82 p.

PHILLIPS, R. W. A clinical investigation of the relationship of mercury to the amalgam restoration. Brooks AFB, Texas, Aerospace Medical Center, 1960. 16 p.

PHILLIPS, R. W. The effects of cavity design on clinical fracture of the amalgam restoration. Brooks AFB, Texas, Aerospace Medical Center, 1960. 11 p.

PHYSICIAN'S FEDERAL INCOME TAX GUIDE, 1961. Great Neck, N. Y., Channel Press, 1961. 112 p. $3.

SCOTT, J. H. & SYMONS, N. B. B. Introduction to dental anatomy. 3d ed. Edinburgh, Livingstone, 1961. 388 p. $9.

SILVERMAN, S. I. Oral physiology. St. Louis, Mosby, 1961. 533 p. $15.

SOBEL, A. I. Interrelationship of tooth composition, body fluids, diet, and caries susceptibility. Brooks AFB, Texas, Aerospace Medical Center, 1960. 11 p.

STOLZENBERG, JACOB. Dental hypnosis handbook. Hollywood, Cal., Wilshire Book Company, 1961. 152 p. $2. Reprint of *Psychosomatics and suggestion therapy in dentistry,* 1955.

SUMMERS, F. W. For the child in your practice; precise and effortless cavity preparations. Melrose Park, Ill., Midwest Dental Mfg. Co., 1960. 12 p.

U. S. DIVISION OF INDIAN HEALTH. DENTAL SERVICE BRANCH. Annual report; fiscal year, 1960. Washington, 1961. 53 p. Mimeo.

U. S. NATIONAL BUREAU OF STANDARDS. Medical x-ray protection up to two million volts; recommendations of the National Committee on Radiation Protection and Measurements. (National Bureau of Standards handbook 76.) Washington, Govt. Print. Off., 1961. 52 p. $0.25.

WIENER, A. S. Advances in blood grouping. New York, Grune & Stratton, 1961. 549 p. $11.

WIKSELL, WESLEY. Do they understand you; a guide to effective oral communication. New York, Macmillan, 1960. 200 p. $4.95.

WOHL, M. G. & GOODHART, R. S., ed. Modern nutrition in health and disease; dietotherapy. 2d ed. Philadelphia, Lea & Febiger, 1960. 1152 p. $18.50.

THE YEAR BOOK OF DENTISTRY, 1960-1961. Chicago, Year Book Publishers, 1961. 480 p. $7.50.

PERIODICALS

ABSTRACTS OF JAPANESE MEDICINE, (Tokyo)

BULLETIN OF TOKYO DENTAL COLLEGE, (Tokyo)

NIHON DAIGAKU SHIKABU DOSOKAI KAISHI, (Tokyo)

Council adopts revision of American Dental Association Specification No. 5 for Dental Casting Gold Alloy

COUNCIL ON DENTAL RESEARCH

The following revision of American Dental Association Specification No. 5 has been approved by the Council on Dental Research as the official specification of the American Dental Association for casting gold alloys. The revision was carried out through the Specifications Committee of the Dental Materials Group (International Association for Dental Research) and by its subcommittees. The Council wishes to acknowledge, with thanks, the work of the subcommittee members, who are: W. T. Sweeney (chairman), Dental Research Section, National Bureau of Standards, Washington, D. C.; G. D. Boulger, W. E. Mowrey Company, St. Paul, Minn.; R. L. Coleman, J. M. Ney Company, Hartford, Conn.; F. J. Demsko, The S. S. White Dental Manufacturing Company, Staten Island, N. Y.; E. O. Liebig, Engelhard Industries, Inc. (Baker Dental Division), East Newark, N. J.; W. O'Brien, J. F. Jelenko & Company, Inc., New York; J. Polak, I. Stern & Company, Inc., Mt. Vernon, N. Y.; D. L. Smith, (secretary), J. M. Ney Company, Hartford, Conn.; P. B. Taylor, Julius Aderer Inc., Long Island City, N. Y. (deceased); H. M. Vernon, Williams Gold Refining Company (formerly Vernon-Benshoff), Pittsburgh; L. E. Waldoch, General Refineries, Inc., St. Paul, Minn.; R. V. Williams, Williams Gold Refining Company, Buffalo, N. Y.; E. M. Wise, International Nickel Company, New York.

AMERICAN DENTAL ASSOCIATION SPECIFICATION NO. 5 FOR DENTAL CASTING GOLD ALLOY

(First revision. Approved February, 1961. Effective January 1962)

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers dental casting alloys based on gold and used in the fabrication of dental restorations and appliances. (See 6.1)

1.2 Classification

1.2.1 Types. Dental casting gold alloy shall be of the following types as specified:

Type I — Soft
Type II — Medium
Type III — Hard
Type IV — Extra Hard

2. APPLICABLE SPECIFICATIONS

2.1 Specification. American Dental Association Specification No. 2 for Casting Investment for Dental Gold Alloy is applicable to 4.4.1, Preparation of specimens. (Copies of American Dental Association specifications may be obtained free upon application to the Council on Dental Research, American Dental Association, 222 E. Superior St., Chicago 11, or to the American Dental Association Research Division, National Bureau of Standards, Washington 25, D. C.)

Table • Composition and physical properties

Type	Gold and platinum-group metals	Brinell number			Tensile strength		Elongation 2-inch gauge length		Fusion temperature	
	Minimum	Quenched		Hardened	Hardened		Quenched	Hardened	Minimum	
	Per cent	Min.	Max.	Min.	Kg/cm² Min.	psi Min.	Per cent Min.	Per cent Min.	°C	°F
I	83	40	75	—	—	—	18	—	927	1700
II	78	70	100	—	—	—	12	—	899	1650
III	78	90	140	—	—	—	12	—	899	1650
IV	75	130	—	200	6328	90,000	10	2	871	1600

3. REQUIREMENTS

3.1 Color. The color of the alloy shall be the color specified by the purchaser.

3.2 Casting. The molten gold alloy shall fill the mold completely when cast into dental casting investment.

3.3 Composition. The composition requirements shall be as given in the table.

3.4 Physical properties. The requirements for physical properties shall be as given in the table.

3.5 Manufacturer's instructions. Instructions for softening and for hardening heat treatment for Type IV extra hard alloys shall be included in the labeling or accompanying literature.

4. SAMPLING, INSPECTION AND TESTING PROCEDURES

4.1 Sampling. Twenty pennyweight of alloy shall be procured at retail by a member of the American Dental Association. This sample shall be forwarded in the original unopened package or packages to the American Dental Association Research Division, National Bureau of Standards, Washington 25, D. C. In addition, the manufacturer shall submit six tensile specimens for Types I, II and III and 12 specimens for Type IV in the as-cast condition with button, sprue and vents attached. The diameter of these specimens shall be not less than 1.78 mm. (0.070 in.) nor more than 2.29 mm. (0.090 in.). The specimens shall be not less than 8.9 cm. (3.5 in.) long.

4.2 Inspection. Visual inspection shall be used in determining compliance with the requirements outlined in 3.1, 3.2 and 5.

4.3 Chemical tests.

4.3.1 Composition. The determined values for metallic constituents (table) shall be recorded to the nearest 0.5 per cent. When a determined value is midway between a half and a whole number, the whole number shall be recorded.

4.4 Physical tests.

4.4.1 Preparation of specimens. Physical properties other than fusion temperature shall be determined on cast specimens placed in a furnace at 699°C. (1,290°F.) for ten minutes and quenched in water at room temperature. Hardened specimens shall be prepared by placing the quenched specimens in an oven heated to 449 ± 5.6°C. (840 ± 10°F.). After they have been in the oven two minutes the temperature shall be reduced uniformly at 6.7 ± 1°C. (12 ± 2°F.) a minute to 249°C. (480°F.) in 30 minutes and immediately shall be quenched in water at room temperature. Cast specimens shall be prepared by casting into a dental casting investment which complies with American Dental Association Specification No. 2 by any dental casting

method. The use of a wax pattern is not required.

4.4.2 Compliance with requirements for tensile properties and hardness specifications. An alloy complies with the tensile and hardness requirements when all of the recorded values for strength, elongation and Brinell number of three or more of a series of six castings of each heat treatment meet the requirements.

4.4.3 Brinell number. Specimens, not less than 2 mm. (0.08 in.) long, shall be sawed from the cast tensile specimens, mounted and polished, using progressively finer abrasive paper ending with a no. 3/0 emery paper. The Brinell number shall be determined by applying a 15 kg. load (33 lb.) on the specimen through a hardened steel ball 1.59 mm. (0.0625 in.) in diameter for 30 seconds. The diameter of the depression shall be determined by measuring two diameters perpendicular to each other and the average shall be used in the calculation of the hardness number. The determined value shall be recorded as the nearest whole number. When the determined number falls midway between two numbers, the even number shall be recorded. The Brinell number shall be calculated by the following formula:

where P = Test load in kilograms
D = Diameter of ball in millimeters
d = diameter of impression in millimeters

$$Bhn = \frac{P}{\pi \frac{D}{2} (D - \sqrt{D^2 - d^2})}$$

4.4.4 Tensile strength. The tensile strength shall be determined on the cast specimens submitted by the manufacturer. The loading rate shall be 90.7 ± 22.7 kg. (200 ± 50 lb.) per minute. The specimen shall be loaded continuously from the initial load to the breaking point. The strength shall be computed on the basis of the original cross-section area.

4.4.5 Elongation. Elongation shall be determined on the specimen used in the test for tensile strength. Castings that break outside the gauge marks may be repulled. Elongation shall be measured on a 50.8-mm. (2-in.) gauge length. The determined value shall be recorded as the nearest 0.5 per cent.

4.4.6 Fusion temperature. The following apparatus shall be used: an electric furnace having a tube muffle approximately 25.4 mm. (1 inch) in inside diameter and mounted in a vertical position; a pyrometer accurate to ± 5°C. (± 9°F.); an ingot of gold 13 mm. (0.5 in.) by 6.4 mm. (0.25 in.) by 0.51 ± 0.13 mm. (0.020 ± 0.005 in.) with holes having a diameter of 1.6 mm. (0.062 in.) centered 2.4 mm. (0.094 in.) from either edge at the center of the 6.4 mm. (0.25 in.) dimension; one piece of 20 gauge [0.81 mm. (0.032 in.)] platinum or chromium-nickel wire (chromel) and a 300-Gm. (10.6 oz.) weight.

The following procedure shall be used: The tip of an alumel-chromel or platinum versus platinum-rhodium thermocouple of 20- or 22-gauge wire [0.81 mm. (0.032 in.) or 0.64 mm. (0.0253 in.)] shall be bent into an "S" shape. The loop of the "S" curve nearest the long leads of the thermocouple shall be hooked into one of the 1.6 mm. (0.062 in.) holes of the ingot. The loop of the "S" curve nearest the hot junction shall be bent so that the hot junction lies near the center of the ingot. A 20-gauge chromium-nickel or platinum wire shall be passed through the hole at the opposite end of the ingot and tied. The long leads of the thermocouple shall be secured at the top of the furnace so that the ingot hangs in the center of the muffle. A 300-Gm. weight shall be attached to the chromium-nickel or platinum wire so that the weight hangs freely below the furnace. The top of the muffle shall be covered with a suitable refractory to prevent air currents. The bottom of the muffle shall be covered with a sheet of asbestos containing a hole 6.4 mm.

(0.25 in.) in diameter. The hole in the sheet shall be centered with the center of the muffle opening to permit unobstructed passage of the loaded wire. The temperature of the furnace shall be raised to within 111°C. (200°F.) of the estimated lower limit of the melting range. The temperature shall then be increased 11 ± 3°C. (20 ± 5°F.) a minute. The temperature at which the ingot breaks under the 300-Gm. load shall be recorded as the fusion temperature. The value shall be reported as the average of tests on three specimens and shall be recorded to the nearest degree Celsius (1.8°F.).

5. PREPARATION FOR DELIVERY

5.1 Packaging. The alloy shall be packaged in accordance with acceptable commercial practice.

5.2 Marking.

5.2.1 Lot numbers. Each container shall be marked with a serial number or combination of letters and numbers which shall refer to the manufacturer's records for the particular lot or batch of alloy.

5.2.2 Date of manufacture. The date of manufacture (year and month) shall be indicated on the container as a separate item or as a part of the serial number (5.2.1).

5.2.3 Net weight. The weight of the contents shall be marked on each container. Individual packets of one and two pennyweight ingots may have a tolerance of minus 1.0 per cent. Packets of 31-Gm. (one troy ounce) lots shall have a tolerance of minus 0.1 per cent maximum.

6. NOTES

6.1 Uses. The four types of alloys specified are ordinarily used for the following dental restorations and appliances.

Type I. Those subject to very slight stress and where burnishing is desired.

Type II. Those subject to moderate stress; ¾ crowns, abutments, pontics, full crowns, and saddles.

Type III. Those subject to high stress; thin ¾ crowns, thin cast backings, abutments, pontics, full crowns, and saddles.

Type IV. Those thin in cross section and subject to very high stress; saddles, bars, clasps, crowns, thimbles, and unit castings.

6.2 References. The following references will assist the observer in testing casting gold alloys for compliance with this specification.

1. Coleman, R. L., Jr. Physical properties of dental materials (Gold alloys and accessory materials). Res. Paper No. 32, Bur. Standards J. Res. 1:867 Dec. 1928.

2. Taylor, N. O.; Paffenbarger, G. C.; and Sweeney, W. T. Inlay casting golds: Physical properties and specifications. J.A.D.A. 19:36 Jan. 1932.

3. Brumfield, P. C. Tentative standard methods of testing precious metal dental materials (Technical Committee, Dental Gold Institute). J.A.D.A. 49:17 July 1954.

Survey of hospital dental departments
IV. Types of dental services rendered

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Inquiry was made as to the availability of seven types of dental services in hospitals having dental departments. Of the seven, oral surgery was performed in the largest proportion of hospitals, 95.5 per cent. Operative dentistry was available next most frequently, in 76.4 per cent, and pedodontics least frequently, in but 35.2 per cent of the hospitals.

Availability of the specified dental services varied according to type of hospital and ownership or control (Tables 17, 18). A rank ordering of the percentage of hospitals in which each of the services was performed places psychiatric hospitals first and hospital departments of an institution second. In other words, four of the seven services were performed in a larger proportion of psychiatric hospitals than in hospitals of other types; two of the seven services were performed in a larger proportion of hospital departments of an institution. At the other end of the scale, allied special and general hospitals ranked last; or, four of the services were performed in a smaller proportion of general hospitals and three services were performed in a smaller proportion of allied special hospitals than in hospitals of other types.

According to hospital ownership or control, federal hospitals ranked first and voluntary hospitals ranked last in availability of the seven dental services. Five of the seven services were available in a larger proportion of federal hospitals than in hospitals under other auspices and five services were available least frequently in voluntary hospitals.

The mean number of dental services available in responding hospitals was 4.8. Psychiatric hospitals had the highest mean of 5.9, followed by hospital departments of an institution with 5.3. Tuberculosis hospitals had a mean of 4.8 dental services; general and allied special hospitals had the lowest mean number of services available, 4.5.

By hospital ownership or control, federal hospitals had the highest mean number of dental services, 5.8, and voluntary hospitals the lowest number, 3.9. In nonfederal governmental hospitals the mean was 4.8 and in proprietary hospitals 4.2.

Hospitals of largest size had the largest number of available dental services, 5.5. However, the mean does not increase progressively from the smallest to largest hospital size group. Thus, it cannot be said that more dental services are available as hospitals increase in size.

Analysis of data by region did not show definitive differences in availability of the seven types of dental services in hospitals having a dental department.

TYPES OF ORAL SURGERY PERFORMED

Respondents were asked about availability of 14 specific oral surgery procedures. Of this group of procedures, extraction

Table 17 • Per cent of hospitals reporting specified types of dental services rendered, by type of hospital

Type of hospital	Dental service						
	Oral surgery	Operative	Oral medicine	Prosthodontics	Periodontics	Oral pathology	Pedodontics
General	97.2	68.8	64.9	54.1	57.1	61.0	31.7
Allied special	82.6	72.5	56.5	55.1	58.0	44.9	59.4
Psychiatric	97.0	97.6	83.4	96.4	85.8	73.4	37.3
Tuberculosis	88.6	82.3	57.0	83.5	68.4	50.6	40.5
Hospital department of an institution	97.7	97.7	72.1	79.1	79.1	62.8	30.2
All hospitals	95.5	76.4	67.2	65.0	64.0	61.3	35.2

of teeth (uncomplicated) was performed in the highest proportion of hospitals, and the surgical removal of teeth was done in almost as many (Table 19). Least frequently performed were intraoral neurectomy for afflictions of the trigeminal nerve and repair of congenital oral defects excluding cleft lips and palates.

The proportion of hospitals in which the oral surgery procedures were performed varied substantially by type of hospital. When the percentages are put in rank order, general hospitals rank first with 12 of the 14 services rendered in a larger proportion of general hospitals than in hospitals of other types. Psychiatric hospitals ranked second; allied special hospitals ranked last.

Data according to hospital ownership or control, size and region do not lend themselves to detailed analysis because in many instances the percentages of hospitals, based on these factors, are relatively close in magnitude. However, there are some exceptions which can be noted. For the following oral surgery services the proportion of federal hospitals in which they were performed was substantially higher than hospitals under other auspices: closure of wound injuries of the mouth and jaws, reduction of fractures of mandible and maxilla, treatment of acute and chronic infections of the mouth and jaws, excision of hard and soft tissue lesions of the mouth and jaws and surgical preparation of the mouth for prosthesis.

At the opposite end of the scale, the proportion of nonfederal governmental hospitals in which the following services were performed was substantially lower than hospitals under other ownership or control: closure of wound injuries of the mouth and jaws, reduction of fractures of mandible and maxilla, open re-

Table 18 • Per cent of hospitals reporting specified types of dental services rendered, by hospital ownership or control

Ownership or control	Dental service						
	Oral surgery	Operative	Oral medicine	Prosthodontics	Periodontics	Oral pathology	Pedodontics
Governmental, nonfederal	94.2	76.2	68.3	70.6	63.1	59.6	36.6
Governmental, federal	99.3	98.2	83.5	93.7	91.5	76.1	28.2
Voluntary	93.2	58.7	52.2	35.1	42.5	50.0	39.8
Proprietary	100.0	61.5	61.5	46.2	42.3	61.5	38.5
All hospitals	95.5	76.4	67.2	65.0	64.0	61.3	35.2

Table 19 • Per cent of hospitals reporting specified types of oral surgery performed, by type of hospital

Type of oral surgery performed	Type of hospital					All hospitals
	General	Allied special	Psychiatric	Tuberculosis	Hospital department of an institution	
Extraction of teeth (uncomplicated)	98.9	98.5	98.8	97.5	100.0	98.8
Surgical removal of teeth	98.2	80.3	96.5	81.3	95.2	95.2
Closure of wound injuries of mouth and jaws	87.9	31.8	77.1	41.3	78.6	78.0
Reduction of fractures of mandible, maxilla	93.1	28.8	72.9	30.0	69.0	79.1
Open reduction of fractures of mandible, maxilla	73.3	18.2	42.9	8.8	28.6	57.1
Reduction of fractures of zygoma	61.4	12.1	37.6	13.8	33.3	48.8
Treatment of acute and chronic infections of the mouth and jaws, including drainage of fascial space abscesses and treatment of osteomyelitis	85.2	51.5	78.2	58.8	73.8	79.1
Osteotomy and ostectomy for congenital and acquired deformities of the jaws	41.5	6.1	21.2	8.8	21.4	32.1
Excision of hard and soft tissue lesions of the mouth and jaws, such as cystic lesions, exostosis and neoplasia (excluding carcinoma)	84.9	43.9	73.5	50.0	61.9	76.3
Surgical preparation of the mouth for prosthesis	87.6	47.0	88.8	72.5	76.2	83.4
Surgical removal of foreign bodies of odontogenic origin from the maxillary sinus. Closure of oroantral fistula	67.0	21.2	41.8	25.0	33.3	54.6
Removal of salivary calculi	68.8	36.4	55.3	42.5	47.6	61.2
Intraoral neurectomy for afflictions of the trigeminal nerve	28.5	9.1	8.2	2.5	7.1	20.6
Repair of congenital oral defects—excluding cleft lips and palates	27.5	13.6	13.5	5.0	16.7	21.9

duction of fractures of mandible and maxilla and reduction of fractures of zygoma.

Respondents were asked the number of in-patients admitted for dental treatment in the past seven days. Responses were summarized for general hospitals only, since the question usually would not be applicable to other types of hospitals. For the most part, other types of hospitals, such as psychiatric or tuberculosis, provide dental care for patients already admitted for other conditions. Among the 562 general hospitals for which information was provided, the mean number of in-patient admissions for dental treatment during the week was 3.8; the median was 2. In one fourth of the responding general hospitals no patients were admitted for dental care and approximately one half had from one to five dental admissions.

Responses to the inquiry on number of dental out-patients treated in the past seven days were summarized for nonfederal general hospitals. Data were limited to this group of hospitals in an effort to have comparability in the meaning of

Table 20 • Other professions participating as members of a health team with dentists, reported by 561 hospitals

Profession	Number of times reported
Medical	1,276
Physician	488
Surgeon	237
Otolaryngologist	127
Plastic surgeon	108
Orthopedist	67
Internist	46
Neurologist and psychiatrist	46
Other specialists	157
Nursing	47
Therapy (including speech, physio- and occupational)	39
Other professions	53
All services	12
Auxiliary personnel	10
Total	1,437

"out-patients." It is believed that out-patient dental care for the general population is provided primarily by general hospitals and therefore that the inquiry pertained to this type of hospital. For the most part, out-patients in nonfederal general hospitals would be those members of the general population who receive dental treatment in the clinic or patients treated in hospital facilities but not admitted to the hospital. Federal hospitals were omitted from the summary because of a difference in meaning of out-patient. For example, military hospitals may include in the count of out-patients dental inspections to troops prior to overseas assignments.

Among the 329 nonfederal general hospitals for which information was reported, the number of dental out-patients during the week ranged from zero to 786. There were no dental out-patients in 38.9 per cent of the responding nonfederal general hospitals. Twenty-three per cent of the hospitals had one to 25 dental out-patients, 6.7 per cent had 25 to 50 dental out-patients and 31.3 per cent had 50 or more out-patients. The wide range in number of dental out-patients is reflected in the fact that the mean was 49.6 whereas the median was 7.

DENTISTS AS MEMBERS OF A HEALTH TEAM

In almost eight out of ten responding hospitals dentists were members of a "health team" on certain types of cases. A higher proportion of federal hospitals, 87.6 per cent, than hospitals under other auspices had dentists participating on a health team. The proportions of hospitals of other ownership ranged from 72.8 to 77.6 per cent. The frequency of dental participation on a health team varied substantially between the different types of hospitals. As might be expected, such participation was most frequent in general hospitals, in 82.8 per cent of the group. In contrast only one half of the tuberculosis hospitals had dentists on a health team. Hospital size was not a factor in whether dentists were members of a health team.

Of the 1,004 hospitals in the survey there were reports from 561 indicating other professions with which dentists participated on a health team; 557 indicated the type of cases involved. In many instances several different professions and types of cases were reported. "Other professions" were mentioned by the 561 hospitals 1,437 times. Doctors of medicine were reported most frequently, 1,276 times. In this group the medical specialist or general practitioner was not specified by a majority of respondents (Table 20). Health teams on which dentists participate are made up principally of the medical profession with infrequent representation by nurses or therapists.

If "health team" is considered to include all professional and auxiliary personnel who have direct concern and contact with the patient, it would appear from these responses that in a majority of instances the health team was incomplete because other than doctors of medicine were infrequently mentioned. Some

exceptions can be noted. One respondent indicated that dentists worked with the specialist in oral surgery, the plastic surgeon, speech therapist and psychologist on cases of cleft lip and palate. Another respondent stated that for cases of cleft palate and jaw resections dentists consulted and worked with medical, plastic surgery, radiology and physical rehabilitation services. A few respondents indicated that "all services" were utilized depending on the case involved.

Respondents were asked to indicate the types of cases on which a health team was involved. The total number of cases reported by 557 hospitals was 1,062. Table 21 summarizes these reports. It will be noted that classifications are not mutually exclusive because some responses indicated cases in terms of specific disease entities, others in broad disease classifications and other cases were stated in terms of treatment.

In approximately 10 per cent of the hospitals in which dentists were members of a health team there had been major disagreement among the health professions as to who should perform certain oral surgical procedures. Of the 79 respondents who reported major disagreement, 16 specified two types of disagreement and one did not specify the nature of the disagreement. Oral surgery and fractures (without further reference to specific procedures) were mentioned most frequently, each by 19 per cent of the 79 respondents. Reduction of fractures of mandible and maxilla was the next most frequent source of friction, by 11.4 per cent of the respondents followed by open reduction of fractures of mandible and maxilla and reduction of fractures of zygoma.

Table 21 • Types of cases on which dentists participate as members of a health team, reported by 557 hospitals

Type of case	Number of times reported
Injuries to face and jaw	244
Tumors	131
Surgery	96
Infections	64
Congenital anomalies of face and jaw	58
Diseases of cardiovascular system	45
Neuro-psychiatric diseases	34
Metabolic diseases	33
Other	357
Total	1,062

Plastic surgeons were mentioned by 35 per cent of the 79 respondents as the profession with which there had been major disagreement about certain oral surgical procedures. Otolaryngologists were mentioned next most frequently by 19 per cent. Approximately 30 per cent did not specify a health profession, but only type of procedure, with which there had been disagreement.

In about four out of ten of the responding hospitals all in-patients were given a dental examination. This practice was most prevalent in the nonfederal governmental hospitals (62.6 per cent). Next in frequency was federal hospitals in one half of which this policy was followed. Hospital in-patients were given dental examinations in only 18.5 per cent of the proprietary and 13.4 per cent of the voluntary hospitals.

The next article in this series will discuss hospital dental clinic facilities, planned expansions in dental departments of hospitals and current research programs.

The 1959 survey of dental practice

XII. Summary

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

To obtain important information about dental practice, a five-page questionnaire was sent in May 1959 to nearly 35,000 dentists throughout the United States. Whereas in earlier surveys of dental practice questionnaires had been sent to every third dentist in each state, in the current survey questionnaires were sent to all dentists in the smaller states and to varying proportions in larger states. The purpose of this change in sampling procedure was to obtain enough returns to allow publication of survey results for each individual state. After the results had been tabulated by state, the sample was balanced by withdrawing a proportion of returns from states that were relatively over-represented, and duplicating and adding returns in six states that were relatively under-represented. By this procedure each state was given its proper weight in the national tabulations.

Usable questionnaires were received from 5,560 dentists. After tabulation of statistics by state, the number of returns in each state was adjusted in a random manner, leaving 3,469 returns, distributed among the states in the same proportions as all dentists were distributed. All tables other than the state tables were prepared from the 3,469 returns.

INCOME OF DENTISTS

Results of this survey indicated that in 1958 mean net income of dentists was $13,956 and median net income was $12,982. For nonsalaried (self-employed) dentists mean net income was $14,311 and mean gross income was $26,030. About one fourth of the nonsalaried dentists had net incomes of less than $9,500 and a similar number more than $18,000. Analogous points for gross income were about $17,000 and $32,000.

Dentists in partnerships reported a mean net income of $16,640, 16.3 per cent higher than the mean for all nonsalaried dentists. Regionally, highest mean net incomes of self-employed dentists were reported in the Far West ($17,588), followed by the Southeast ($15,006); the Southwest ($14,938); the Northwest ($14,189); Central ($13,725); New England ($13,232) and the Middle East ($13,170). Mean gross incomes ranged from a high of $32,813 in the Far West to $23,827 in the Middle East.

Net incomes of nonsalaried dentists were lowest in the smallest towns and highest in cities of 50,000 to 500,000 population. Although mean net income in cities of over 1,000,000 population was almost the same as the national average, in three of these cities, New York, Chicago and Philadelphia, it was well below the national average, and in two of these cities, Los Angeles and Detroit, income was substantially above the national average.

Mean net income of nonsalaried den-

tists was highest in the age groups 35 to 39, followed very closely by the age group 40 to 44. For dentists between the ages of 45 and 54, income was about $1,000 lower. There was a substantial decline in income for each age group beyond age 55.

Approximately one of every 11 dentists participating in the survey derived part of his 1958 dental income from salary and part from self-employment. Mean net income of part-salaried dentists was $12,416, and median net was $10,790.

One of every 23 respondents received all of his 1958 dental income from salary, and the mean salary was $9,962.

Nonsalaried specialists reported a mean net income of $21,244, 56.0 per cent higher than that of nonsalaried general practitioners. Among self-employed specialists, orthodontists reported the highest mean net income ($25,052), followed by pedodontists ($19,600) and oral surgeons ($18,492).

Among nonsalaried dentists having only one dental chair, those having one full-time assistant had a mean net income 52.0 per cent higher than those without employees. For dentists with two chairs and two assistants, net income was about 63 per cent higher than that of dentists with one chair and one assistant.

Of the dentists having two chairs and one assistant, those with two dental units reported a mean net income of $14,281, compared to $11,729 for those with one unit.

Based on the gross income reported by self-employed dentists in this survey, it was estimated that consumers paid $2,000,000,000 for dental care during 1958.

PROFESSIONAL EXPENSES

Of the $2,000,000,000 in fees collected by self-employed dentists in 1958, 45.0 per cent, or $900,000,000, was paid by dentists for professional expenses. The largest item of expense was salaries, for which the average dentist paid $3,398, followed by commercial dental laboratory charges ($2,508), dental supplies and drugs ($1,512), and office rent ($1,324). Total professional expenses of the average dentist were $11,719.

Dentists paid an estimated $190,000,000 to commercial dental laboratories in 1958.

Regionally, the expense ratio (professional expenses as a percentage of gross income) ranged from 46.4 per cent in the Far West to 43.3 per cent in the Central region. The expense ratio was lowest in towns of less than 1,000 population and varied little among the other city-size groups. The expense ratio for orthodontists was relatively low (35.5 per cent) and for oral surgeons it was relatively high (48.4 per cent). Although the expense ratio increased as number of employees increased, gross income increased so much with additional employees that net income also increased substantially.

Dentists were asked whether they had purchased any new or used equipment in 1958, and, if so, how much was paid for such equipment. About 60 per cent of the nonsalaried dentists had purchased equipment. The mean amount spent for dental equipment by all nonsalaried dentists participating in the survey was $966, or approximately $1,600 for those who had purchased equipment.

AUXILIARY PERSONNEL

Eighty-two per cent of self-employed dentists employed auxiliary personnel in 1958, either full- or part-time. Dental assistants were employed by 75.5 per cent, secretaries or receptionists by 16.1 per cent, hygienists by 14.0 per cent and technicians by 5.4 per cent. The proportion of dentists employing assistants was highest in the age group 30 to 39 (83.4 per cent) and lowest among dentists over 70 (46.8 per cent). "Full-time positions occupied all year" were reported as follows:

assistants, 65.6 per cent, secretaries or receptionists, 10.5 per cent, hygienists, 6.5 per cent and technicians, 3.5 per cent.

There were large regional differences in the percentage of dentists employing hygienists (either full- or part-time). The range was from 27.2 per cent in New England to 6.9 per cent in the Southwest. Specialists employed more auxiliary personnel than did general practitioners. Oral surgeons employed the most secretaries and receptionists; orthodontists, the most technicians; pedodontists, the most assistants, and periodontists, the most hygienists.

Mean salaries paid to full-time auxiliary personnel in 1958 were as follows: hygienists, $4,396; technicians, $4,652; assistants, $2,703, and secretaries and receptionists, $2,931.

THE WORK WEEK AND WORK YEAR

Self-employed dentists estimated they spent an average of 43.1 hours per week in the office during 1958. By age, the range was from 45.6 hours for dentists under 30 to 33.7 hours for dentists 75 and older.

The breakdown of the 43.1 hours in the office was as follows: 34.2 hours at the chair, 3.8 hours in the laboratory, 2.5 hours doing other work and 2.6 hours of free time. Dentists in the lowest age group reported the most free time—5.7 hours. Number of hours at the chair was highest for dentists 40 to 44 years of age (35.5 hours), but was only slightly lower for dentists 30 to 39 and 45 to 54 years of age.

For self-employed dentists, the mean number of weeks worked in 1958 was 47.3 and the median was 48.5. The mean was brought down by the 1958 graduates, all of whom worked less than half of the year. Multiplying number of office hours by number of weeks worked yields an estimate of 2,039 hours in the office and 1,618 hours at the chair, for the average nonsalaried dentist.

The typical self-employed dentist averaged a gross income of $12.77 per hour in the office or $16.09 per hour at the chair. His average net income was $7.02 per hour in the office or $8.84 per hour at the chair.

The mean amount of vacation time taken by nonsalaried dentists was 3.1 weeks and the median was two weeks. More than one third of the dentists under 30 years of age reported taking no vacation during 1958; for other age groups, between 5 and 10 per cent took no vacation. Oral surgeons were characterized by relatively short vacations and periodontists by long vacations.

Dentists were asked how many days they were absent from work during the year because of illness or other disability. The mean reply was 3.3 days, considerably lower than the mean of 4.8 days in 1952.

Dentists classifying themselves as specialists were asked to indicate the percentage of their practice time devoted to their specialty. More than 90 per cent of the oral surgeons, orthodontists and pedodontists devoted all of their practice time to their specialty. For periodontists, the figure was 69.2 per cent.

NUMBER OF PATIENTS

Nonsalaried dentists were asked to indicate, if possible, the number of different patients seen during the year, and the number of patient visits. Many respondents were unable to provide information on the number of patients. The mean number of patients reported by self-employed dentists was 1,184 and the median was 900. The mean number of patient visits was 3,130 and the median was 2,899.

Mean number of patients varied greatly with type of practice, from 2,507 for oral surgeons to 323 for orthodontists. For general practitioners, the mean was 1,191. Dentists who were members of partnerships reported an average of

1,954 patients, 68.9 per cent more than dentists in solo practice with no sharing of costs and 59.1 per cent more than dentists in solo practice who shared professional expenses with other practitioners.

Dentists who used low and intermediate speed handpieces exclusively averaged about 1,035 patients, compared to 1,262 for dentists who used high and super speed handpieces.

Based on the number of patients per dentist, it is estimated that 81,000,000 people, or 47 per cent of the civilian population, went to self-employed dentists during 1958.

DENTIST BUSYNESS

Nonsalaried dentists were asked "During 1958, approximately how long did your average patient have to wait for the initial appointment of a series (excluding emergency cases)?" More dentists (21.9 per cent) checked "one week" than any other length of wait for an appointment. The mean number of days of wait for an appointment was 11.8, compared to 12.8 days in 1955 and 13.6 days in 1952.

Of the seven regions, the longest average wait for an appointment was reported by dentists in the Northwest (16.2 days), followed by the Southeast (13.1 days), the Far West (13.1 days), New England (12.6 days), Central (12.4 days), the Southwest (10.3 days) and the Middle East (9.2 days). The average wait reported by oral surgeons was 2.5 days. At the other extreme were orthodontists, with an average wait of 16.5 days.

In another question relating to busyness, dentists were asked to check which of the following statements best described their practice for the year 1958 as a whole: (1) Because of the length of your appointment list, some persons who contacted you for dental care actually obtained this care from another dentist. (2) You provided dental care for all who requested appointments, but you felt more rushed and worked more hours than you would have liked. (3) You provided dental care for all who requested appointments, and did not feel "overworked." (4) You did not have as many patients as you would have liked.

Statement 1 was checked by 21.1 per cent of the nonsalaried respondents; statement 2 by 22.4 per cent; statement 3 by 38.4 per cent, and statement 4 by 18.1 per cent. In other words, it may be said that 43.5 per cent of the respondents were "too busy" (either felt overworked or were unable to accommodate all would-be patients), 18.1 per cent were not busy enough and the remaining 38.4 per cent found that there was a good balance between demand for dental care and their ability to provide it. The range among the seven regions in percentage "too busy" was from 40.4 per cent in the Middle East to 55.4 per cent in the Northwest. The range by type of practice was from 10.5 per cent of oral surgeons to 52.0 per cent of periodontists.

DENTAL PATIENTS AND SERVICES RENDERED

Nonsalaried dentists were asked to record the age, sex and services rendered for each patient on a specified day. Every sixth dentist was assigned Monday, May 18, every sixth Tuesday, May 19, and so on through Saturday of that week. By this method it was possible to take into account any variations in age, sex and other characteristics of dental patients according to day of the week, without asking each dentist to keep a record of an entire week of practice.

The analysis included data on 25,901 patients. More patients fell in the 10 to 14 age group (12.7 per cent) than in any other five-year age group, followed closely by the age group 5 to 9 (12.0 per cent). However, as a percentage of the population, the number of patients was greatest in the age group 35 to 39, followed closely

by the age group 15 to 19. The percentage of the population represented in the survey sample was lowest for the age group 4 and younger, followed closely by the age group 75 and older.

For all ages combined, there were 130 female patients for every 100 male patients. For patients in their 20's, there were 163 women for every 100 men.

The average number of patient visits for the day on which dentists kept a record of their practice was 12.9 per dentist. (Some dentists did not work the entire day, particularly those who were assigned Saturday as a day of record.) The mean number of patient visits was 9.6 for dentists under 30, increased to 14.2 for dentists 35 to 39 and declined to about 9.0 for dentists 70 and older.

More patients (5,340) received two-surface amalgam fillings than any other dental service, followed by one-surface amalgam fillings (5,205), oral examinations (5,200), prophylaxes (5,155) and roentgenograms (4,685). In total number of services, roentgenograms (18,081) ranked first, followed by one-surface amalgam fillings (8,087), two-surface amalgam fillings (7,377) and simple extractions (5,451). Slightly over three fourths of all fillings were amalgam.

The percentage of patients receiving one- and two-surface amalgam fillings was highest in the age group nine and younger, almost as high in the age group 10 to 19 and declined with each higher age group. However, gold inlays, acrylic and silicate cement fillings were provided more frequently for people of middle age.

The percentage of patients having teeth removed was greatest in the highest age group. In each age group, a higher percentage of males than of females had teeth extracted.

Although the number of complete upper and lower dentures provided was greatest for patients in their 50's, the percentage of patients receiving complete dentures was highest among patients 70 and older, followed by patients in their 60's. The percentage receiving periodontal treatment was highest among patients in their 40's and 50's.

The Bureau conducted a survey of dental practice in 1950 in which dentists were asked to keep a record of their practice for a week. Roentgenograms were taken at 18.1 per cent of the patient sittings in the current survey, compared to only 10.8 per cent in the 1950 survey. Dental prophylaxes were provided at 19.9 per cent of the sittings in 1959, compared to 14.2 per cent in 1950. Complete upper dentures were provided at 1.4 per cent of the sittings and complete lowers at .9 per cent of the sittings in both the 1950 and the 1959 surveys. The fact that there was no decrease in the provision of complete dentures would appear to indicate that the amount of illegal, direct denture service to the public by technicians has not increased greatly during the last decade.

It is estimated that 1/9200 of all patient visits to the offices of private practitioners during 1959 were included in this survey. Multiplying the number of services recorded in this survey by 9,200 thus provides an estimate of the total number of those services provided for the civilian population during the year. Estimates for some of the services are as follows: prophylaxes, 47,500,000; roentgenograms, 166,000,000; fillings (including inlays), 200,000,000; extractions, 60,000,000; crowns, 4,700,000; fixed bridges, 2,400,000; complete dentures, 5,600,000; partial dentures, 3,700,000; orthodontic sittings, 8,800,000; periodontal sittings, 7,700,000; root canal treatments, 4,100,000, and flouride treatments, 2,200,000.

OTHER SURVEY TOPICS

Although only 17.2 per cent of the self-employed dentists used low speed (under 10,000 rpm) handpieces exclusively, this figure varied from 3.9 per cent of the dentists under 30 to 67.8 per cent of the dentists 70 and older. Forty-six per cent

of the dentists reported handpiece speeds of not less than 100,000 rpm, and 61.0 per cent reported speeds of not less than 30,000.

Dentists using high speed drilling equipment were asked to indicate what had been the major effect of the use of such equipment on the practice. Of the two responses listed on the questionnaire, 52.7 per cent checked "It has increased the number of patients treated by you" and 37.2 per cent checked "It has reduced your time in the office." Of the write-in replies, the most common was that high speed equipment had made the dentist's work easier or reduced his fatigue (26.3 per cent). Reduction of the patient's tension or increase of the patient's acceptance of dental treatment was mentioned by 14.6 per cent.

Eighty-four per cent of the nonsalaried dentists reported having a patient recall system. Older dentists and dentists in small towns were below average in the use of recall systems. Dentists having a recall system were asked whether it included patients having two complete dentures, and about one fourth of them answered affirmatively.

Nine out of 10 dentists indicated they accepted patients of all ages. Not quite 5 per cent excluded children and 1.5 per cent excluded adults.

Eighty-nine per cent of the nonsalaried respondents reported writing one or more prescriptions for drugs during the preceding six months. The percentage was highest for the youngest dentists and lowest for the oldest dentists. The average number of prescriptions written per dentist was about twice as high in the Southwest and the Southeast as in New England or the Central region. It is estimated that self-employed dentists wrote 11 million prescriptions for drugs during 1958.

Nine types of courses and programs in advanced dental education were listed on the questionnaire, and 81 per cent of self-employed dentists indicated they had taken one or more of these courses since graduation. Forty-five per cent reported they had taken some type of advanced dental education during 1958.

One third of all nonsalaried dentists answered "yes" to the question "do you have an appointment to a hospital dental staff?" By age, the figure was highest for dentists in their 40's (37.4 per cent) and lowest for dentists 70 and older (11.9 per cent).

Survey of public attitudes regarding dentures
V. An opinion scale

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Nine statements regarding dentistry were listed on the questionnaire and respondents were asked to indicate the extent to which they agreed or disagreed with each statement. These statements related mainly to prosthetic dental services and dental fees. The questionnaire included a few questions that did not relate to prosthetic dentistry, because many adults have no artificial teeth and would feel that the questionnaire did not apply to them if it pertained entirely to prosthetics.

In Table 33, it will be noted that the percentage of respondents declining to agree or disagree with the nine statements ranged from 7.5 per cent to 64.0 per cent. In interpreting these statistics, it is helpful to combine those who checked "agree strongly" and "agree somewhat" and compare this figure with the total of those who checked "disagree somewhat" and "disagree strongly." The ratio of those who "agree" to those who "disagree" provides a good index of the opinions of those holding an opinion.

The statement "In general, fees of dentists are reasonable" was agreed with, either strongly or somewhat, by 51.5 per cent of the survey participants and disagreed with by 39.3 per cent, with 9.2 per cent indicating they did not know or failing to answer the question (Table 33). Paradoxically, the majority also agreed with the statements "Most dentists charge too much for fillings" and "Most dentists charge too much for false teeth." Of those who expressed an opinion, a larger proportion thought charges for "false teeth" were too high than thought charges for fillings were excessive. However, the percentage of respondents expressing an opinion regarding fee level was higher for fillings than for "false teeth."

It is true, of course, that people tend to be critical about prices in general, particularly during an extended inflationary period. This should be taken into consideration in any interpretation of the responses to the questions on dentists' fees.

Operative and prosthetic dentistry account for approximately two thirds of all dental expenditures. Therefore, if people think that dental fees in general are reasonable, it would seem that they would also think that fees for fillings or "false teeth," or both, are reasonable. A possible explanation of the inconsistency in response is that uncritical people lacking in information may tend to accept as correct any statement they see in print. In other words, some of the people having insufficient knowledge to form an opinion probably checked "agree" to nearly all of these nine statements.

Young people were considerably more inclined than older people to agree with

Table 33 • Percentage distribution of respondents according to agreement with nine statements regarding dentistry

Statement	Agree strongly	Agree somewhat	Disagree somewhat	Disagree strongly	Don't know or no answer	Total
In general, fees of dentists are reasonable	12.6	38.9	25.1	14.2	9.2	100.0
Most dentists charge too much for fillings	26.7	32.2	18.1	6.1	16.9	100.0
Most dentists charge too much for false teeth	34.9	22.0	9.4	5.6	28.1	100.0
A person should always go to a dentist to get false teeth that are satisfactory	60.5	13.9	4.1	1.8	19.7	100.0
A person can get false teeth that are satisfactory directly from a dental laboratory technician	3.9	9.6	9.0	13.5	64.0	100.0
It is necessary to go to a dentist for repair of broken plates	36.4	13.7	9 8	5.7	34.4	100.0
It is necessary to go to a dentist to have plates relined	33.4	13.1	8.4	5.0	40.1	100.0
For people with two full plates, regular visits to the dentist are not necessary	20.4	17.9	15.8	9.9	36.0	100.0
Most dentists have a high degree of skill and knowledge	58.2	27.7	5.1	1.5	7.5	100.0

the statement "In general, fees of dentists are reasonable" (Table 34). With respect to the charges for specific services —fillings and dentures—the age gradient was not pronounced.

Regionally, the percentage of respondents agreeing with the statement that "In general, fees of dentists are reasonable" was highest in the Middle East (57.3 per cent) and New England (56.4 per cent), and lowest in the Southwest (44.4 per cent), Far West (44.8 per cent) and the Northwest (46.2 per cent) (Table 35). The statement was agreed with by a larger percentage of women (54.3 per cent) than of men (48.2 per cent) (Table 36).

There was a significant correlation between amount of education and agreement with the statement that dentists' fees were generally reasonable (Table 37). There was a similar correlation between agreement with this statement and level of family income, with the exception of respondents with family income under $1,000. It seems plausible that this income group would include many retired persons; if so, annual income would not be a good measure of economic status for this group.

Three fourths of all respondents agreed with the statement "A person should always go to a dentist to get false teeth that are satisfactory," and 13.5 per cent agreed with the contradictory statement, "A person can get false teeth that are satisfactory directly from a dental laboratory technician" (Table 33). However, only 22.5 per cent disagreed with the latter statement, and about two thirds of all respondents declined to give an opinion regarding this statement. By age of respondent, there was little variation in the responses to these two statements (Table 34).

Regionally, the percentage of respondents agreeing that a person should always go to a dentist to get dentures did not vary greatly (Table 35). The ratio of the number agreeing to the number disagreeing, however, varied from 8.0 in New England to 16.7 in the Northwest. For the contradictory statement (that satisfactory dentures could be obtained directly from a technician), the percent-

Table 34 • Percentage of respondents agreeing and disagreeing with nine statements regarding dentistry, by age

Statement	Age										All ages	
	20–29		30–39		40–49		50–59		60–			
	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree
In general, fees of dentists are reasonable	62.1	33.8	56.4	39.6	51.6	42.2	46.6	41.8	43.7	37.5	51.5	39.3
Most dentists charge too much for fillings	58.5	31.1	64.0	26.6	62.9	24.8	57.8	21.8	50.0	19.3	58.9	24.2
Most dentists charge too much for false teeth	54.0	13.8	53.7	14.0	56.3	13.2	60.9	15 8	60.0	18.1	56.9	15.0
A person should always go to a dentist to get false teeth that are satisfactory	70.4	4.7	74.5	4.9	73.2	6.8	74.8	7.0	77.9	5 4	74.4	5.9
A person can get false teeth that are satisfactory directly from a dental laboratory technician	11.9	16.9	12.6	23.6	15.0	24.0	15.4	22.8	12.1	22.3	13.5	22.5
It is necessary to go to a dentist for repair of broken plates	46.4	12.0	44.3	17.9	48.2	17.3	52.4	16.9	59.0	11.2	50.1	15.5
It is necessary to go to a dentist to have plates relined	41.8	8.7	41.7	14.3	45.3	14.6	48.5	15.0	54.2	11.9	46.5	13.4
For people with two full plates, regular visits to the dentist are not necessary	26.0	31.3	29.6	32.0	37.6	25.7	43.3	23.8	52.0	16.8	38.3	25.7
Most dentists have a high degree of skill and knowledge	86.9	6.9	88.1	6.3	86.1	7.7	85.3	7.2	82.9	5.5	85.9	6.6

age agreeing was highest in New England (17.9 per cent), followed closely by the Middle East (17.0 per cent), and was lowest in the Northwest (6.5 per cent). From these responses it appears that the people of New England were most disposed to obtaining dentures directly from technicians, whereas people from the Northwest were least disposed to do so.

The percentage of respondents agreeing that a person should always go to a dentist to get dentures varied little according to sex, educational level and income (Tables 36, 37 and 38). However, 16.9 per cent of the men thought satisfactory dentures could be obtained directly from a technician, compared to only 10.5 per cent of the women. Responses to this statement also varied significantly according to educational level, with 24.3 per cent of those having no formal schooling compared to only 10.3 per cent of those who had gone to college agreeing that satisfactory dentures could be obtained from technicians.

Respondents were asked whether they agreed or disagreed that it was necessary to go to a dentist (1) for repair of broken

Table 35 • Percentage of respondents agreeing and disagreeing with nine statements regarding dentistry, by region

Statement	New England		Middle East		Southeast		Southwest		Central		Northwest		Far West	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
In general, fees of dentists are reasonable	56.4	29.9	57.3	34.6	49.7	38.8	44.4	44.0	54.7	35.8	46.2	46.5	44.8	48.4
Most dentists charge too much for fillings	56.1	23.8	56.2	26.8	60.5	20.7	58.0	22.8	55.9	24.7	62.2	22.9	64.2	24.5
Most dentists charge too much for false teeth	60.0	12.0	58.0	14.2	56.3	13.5	54.2	14.8	55.7	15.9	55.1	16.1	58.4	16.5
A person should always go to a dentist to get false teeth that are satisfactory	75.7	9.5	77.5	5.5	75.1	5.3	71.3	7.0	74.9	5.3	73.6	4.4	71.2	6.4
A person can get false teeth that are satisfactory directly from a dental laboratory technician	17.9	25.1	17.0	24.8	11.5	19.6	13.2	21.6	12.1	19.8	6.5	20.4	13.8	25.7
It is necessary to go to a dentist for repair of broken plates	47.5	22.6	51.1	16.3	53.1	11.0	48.5	13.9	53.6	13.9	47.3	16.3	44.3	18.5
It is necessary to go to a dentist to have plates relined	46.4	15.1	44.4	12.8	46.1	9.7	46.7	11.6	48.6	14.3	46.0	16.0	46.8	14.8
For people with two full plates, regular visits to the dentist are not necessary	40.8	22.0	36.2	27.6	37.6	22.6	34.9	23.4	39.1	26.8	39.2	26.3	40.3	26.1
Most dentists have a high degree of skill and knowledge	84.0	9.3	87.9	5.9	83.5	6.2	76.3	10.0	87.1	6.6	84.2	5.5	87.7	6.3

Table 36 • Percentage of respondents agreeing and disagreeing with nine statements regarding dentistry, by sex

Statement	Male		Female	
	Agree	Disagree	Agree	Disagree
In general, fees of dentists are reasonable	48.2	42.9	54.3	36.2
Most dentists charge too much for fillings	58.2	25.1	59.5	23.4
Most dentists charge too much for false teeth	58.7	15.2	55.3	14.9
A person should always go to a dentist to get false teeth that are satisfactory	73.6	7.3	75.3	4.6
A person can get false teeth that are satisfactory directly from a dental laboratory technician	16.9	24.3	10.5	20.9
It is necessary to go to a dentist for repair of broken plates	48.4	18.7	51.5	12.8
It is necessary to go to a dentist to have plates relined	45.5	16.0	47.5	10.9
For people with two full plates, regular visits to the dentist are not necessary	38.9	25.1	37.8	26.2
Most dentists have a high degree of skill and knowledge	83.7	7.8	87.7	5.6

"plates" and (2) to have "plates" relined. Between three and four times as many respondents agreed that it was necessary to go to a dentist as disagreed (Table 33). More than one third of the respondents, however, declined to give an opinion regarding these two statements. In general, the percentage of respondents agreeing that it was necessary to receive these services from a dentist increased with the age of the respondents (Table 34). Regional variation in agreement with these two statements was not large; however, the percentage agreeing was greatest for both statements in the Central region (Table 35). Slightly more of the women than of the men agreed that it was necessary to go to a dentist for denture repair and relining, despite the fact that fewer of the women gave an opinion (Table 36). In other words, the percentage of men disagreeing with these two statements was considerably greater than the percentage of women.

Responses to the statement "It is necessary to go to a dentist for repair of broken plates" varied sharply with educational level, but in a direction opposite from what might be expected (Table 37). Nearly twice as large a percentage of the respondents with no formal education agreed with this statement as compared with the percentage of respondents with college training. On the other hand, there was no distinct trend in responses to the statement regarding the relining of dentures according to the education of the respondent.

The percentage of respondents agreeing that it was necessary to go to a dentist for repair of broken plates declined somewhat with increasing family income, from 59.7 per cent of those with income under $1,000 to 43.9 per cent of those with income $10,000 and over (Table 38). The percentage of people agreeing that it was

Table 37 • Percentage of respondents agreeing and disagreeing with nine statements regarding dentistry by educational level

Statement	Educational level							
	No formal schooling		Some or all of elementary school		Some or all of high school		Some or all of college	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
In general, fees of dentists are reasonable	43.2	24.3	41.8	41.9	52.9	40.0	58.5	35.1
Most dentists charge too much for fillings	51.3	13.5	54.9	18.5	62.2	23.3	54.2	33.8
Most dentists charge too much for false teeth	59.5	18.9	60.8	16.3	58.2	14.6	49.0	14.3
A person should always go to a dentist to get false teeth that are satisfactory	73.0	8.1	76.1	5.9	73.7	6.1	74.4	5.3
A person can get false teeth that are satisfactory directly from a dental laboratory technician	24.3	21.6	14.5	16.5	13.9	22.2	10.3	30.2
It is necessary to go to a dentist for repair of broken plates	70.3	5.4	62.5	9.3	48.6	16.1	39.8	20.6
It is necessary to go to a dentist to have plates relined	43.3	13.5	54.6	11.1	46.1	13.4	38.5	14.9
For people with two full plates, regular visits to the dentist are not necessary	27.0	32.4	47.4	18.5	38.0	25.4	29.7	34.2
Most dentists have a high degree of skill and knowledge	70.3	10.8	82.4	5.9	86.3	6.9	88.7	6.9

necessary to go to a dentist to have plates relined was also greatest in the "under $1,000" income group (54.7 per cent) and lowest in the "$10,000 and over" group (40.4 per cent).

One of the nine statements was "For people with two full plates, regular visits to the dentist are not necessary." A little more than one third (38.3 per cent) agreed with this statement, 25.7 per cent disagreed and 36.0 per cent declined to give an opinion (Table 33). More of the older than of the younger people knew that people with complete dentures should see the dentist regularly (Table 34). The range was from 26.0 per cent of those under 30 to 52.0 per cent of those 60 and older. Variation in responses to this statement by region and by sex of respondent were small (Tables 35 and 36).

With the exception of the small number of respondents with no formal schooling, correctness of response to the statement "For people with two full plates, regular visits to the dentist are not necessary" increased substantially with increased education (Table 37). This statement was agreed with by 47.4 per cent of persons whose education had stopped with elementary school, compared to 29.7 per cent of those who had gone to college. In general, correctness of response to this statement tended to increase with increased family income (Table 38).

Of all nine statements, the statement "Most dentists have a high degree of skill and knowledge" was agreed with by the greatest number of respondents (85.9 per cent) (Table 33). The ratio of agreement to disagreement, 13 to 1, was also

Table 38 • Percentage of respondents agreeing and disagreeing with nine statements regarding dentistry, by family income

Statement	Family income																	
	Under $1,000		$1,000–$1,999		$2,000–$2,999		$3,000–$3,999		$4,000–$4,999		$5,000–$5,999		$6,000–$6,999		$7,000–$9,999		$10,000 and over	
	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree	Agree	Dis-agree
In general, fees of dentists are reasonable	48.2	32.3	39.9	39.0	43.2	43.8	49.8	38.5	50.0	42.3	54.8	38.2	55.1	39.4	55.6	39.2	59.8	32.6
Most dentists charge too much for fillings	58.3	15.1	52.1	16.4	57.4	18.9	56.9	24.3	61.7	23.9	63.3	23.5	62.0	26.3	60.2	26.4	50.4	34.7
Most dentists charge too much for false teeth	60.4	15.9	61.6	17.8	58.8	16.7	58.2	12.1	60.3	16.5	57.3	14.2	57.6	14.3	54.3	13.5	45.7	16.1
A person should always go to a dentist to get false teeth that are satisfactory	78.4	4.4	73.4	4.2	76.8	4.7	75.3	5.5	72.6	5.9	73.4	7.2	74.5	6.9	73.8	6.8	76.5	4.2
A person can get false teeth that are satisfactory from a dental laboratory technician	12.2	20.2	12.2	16.5	12.5	16.8	13.1	18.6	13.7	22.2	17.7	21.9	13.7	24.6	13.2	25.9	9.9	32.4
It is necessary to go to a dentist for repair of broken plates	59.7	5.8	59.5	10.1	58.3	11.1	55.9	11.4	49.7	16.0	45.1	18.8	46.4	18.8	45.6	17.7	43.9	18.8
It is necessary to go to a dentist to have plates relined	54.7	10.1	51.7	12.0	53.7	8.9	47.9	10.1	46.4	13.1	44.0	14.7	45.9	16.2	43.3	15.9	40.4	15.2
For people with two full plates, regular visits to the dentist are not necessary	48.9	18.8	52.3	17.7	44.6	20.8	41.0	22.7	39.2	24.6	35.1	28.2	37.0	27.8	32.3	30.4	29.8	30.0
Most dentists have a high degree of skill and knowledge	79.1	5.8	80.4	6.1	82.8	6.6	84.5	6.2	86.0	6.9	87.1	7.1	86.6	7.0	88.2	7.3	89.5	4.9

greatest for the statement regarding skill and knowledge.

Regionally, the percentage of respondents agreeing that most dentists have a high degree of skill and knowledge varied relatively little, from 87.9 per cent in the Middle East to 76.3 per cent in the Southwest (Table 35). The ratio of number agreeing to number disagreeing, however, varied considerably: from 15.3 in the Northwest to 7.6 in the Southwest.

The percentage of respondents agreeing with the statement regarding skill and knowledge of the dentist increased with educational level, from 70.3 per cent of respondents with no formal schooling to 88.7 per cent of those who had gone to college (Table 37). By family income, the percentage agreeing with this statement increased from 79.1 per cent in the lowest income bracket to 89.5 per cent of those in the highest income bracket (Table 38).

The next chapter in this series will present information on frequency of visits to the dentist.

Council announces classification of additional products

COUNCIL ON DENTAL THERAPEUTICS

The classification of products by the Council on Dental Therapeutics has been described in a previous report (J.A.D.A. 40:489 April 1950). The Council's program provides for classification of products in Group A, Group B, Group C and Group D. Products are reconsidered periodically, and decisions are subject to change at any time that a substantial amount of new evidence becomes available. The files of the Council contain information on many drugs and dental cosmetics and inquiries are welcome.

GROUP A

Listing of products in Group A means that at the time of their consideration, the items conformed with the provisions for acceptance established by the Council on Dental Therapeutics and adopted by the House of Delegates of the American Dental Association. Items in this group will be listed in *Accepted Dental Remedies*, and may use the Seal of Acceptance, unless otherwise provided.

The following additional products have been classified in Group A:

Lidocaine, U.S.P. (See A.D.R. 1961, p. 27, 35)

Xylocaine Ointment 5% Flavored (Astra Pharmaceutical Products, Inc.) Each 100 Gm. is stated to contain lidocaine (base), 5 Gm., in an ointment consisting of polyethylene glycol 1,500, polyethylene glycol 4,000, U.S.P., propylene glycol, U.S.P., and flavor. Marketed in 3.5 Gm. collapsible tubes.

Lidocaine Hydrochloride (See A.D.R. 1961, p. 27)

Xylocaine HCl 4% Topical Solution (Astra Pharmaceutical Products, Inc.)

Each 100 ml. is stated to contain lidocaine hydrochloride, 4 Gm.; methylparaben, 0.1 Gm. and water.

Guaiacol, N.F. X (See A.D.R. 1961, p. 115)

Guaiacol in Glycerin (Stratford-Cookson Company): Each 100 ml. is stated to contain glycerin, U.S.P., 65 ml. and guaiacol, U.S.P., 35 ml., plus flavor.

Zinc Oxide Preparations (See A.D.R. 1961, p. 180)

Zinc Oxide-Eugenol Temporary Cement (Merrick Laboratories): Powder: Each 100 Gm. is stated to contain zinc oxide, 99.8 Gm.; zinc acetate, 0.2 Gm. Liquid: Eugenol.

GROUP B

Listing of products in Group B means that there is insufficient evidence to justify their present acceptance, but there is reasonable evidence of their usefulness and safety. These products meet the other qualifications and standards established by the Council on Dental Therapeutics.

The Council's initial consideration of products which may be eligible for Group B listing is influenced favorably by the knowledge of further investigations then in progress. It is the policy of the Council to reconsider Group B products each year on the basis of new evidence which may be produced in their support. Classification in this category is not ordinarily continued for more than three years.

GROUP C

Listing of products in Group C means that the evidence is so limited or inconclusive that the product cannot be accurately evaluated. It is the Council's opinion that Group C products require further study by qualified investigators.

GROUP D

Listing of products in Group D means that they are unacceptable because of their demonstrated inability to meet the standards outlined in the provisions for acceptance.

deaths

BUREAU OF MEMBERSHIP RECORDS

Ace, Levi E., Stroudsburg, Pa.; University of Pennsylvania School of Dentistry, 1906; died December 20; age 79.

Addie, Charles B., Philadelphia; Temple University School of Dentistry, 1912; died November 1; age 79.

Akerly, Guy W., Milford, Ill.; Chicago College of Dental Surgery, 1918; died December 10; age 65.

Amacker, Charles F., Poplarville, Miss.; Atlanta Dental College, 1913; died October 4; age 68.

Ambrose, Richard D., Wichita, Kan.; Ohio College of Dental Surgery, University of Cincinnati, 1900; died December 5; age 80.

Anderson, Maynard C., Minneapolis; University of Minnesota School of Dentistry, 1933; died October 24; age 54.

Anderson, William R., Cockeysville, Md.; University of Pennsylvania School of Dentistry, 1903; died July 28; age 78.

Andrews, Leonard R., Astoria, Ore.; North Pacific College of Oregon School of Dentistry, 1919; died October 13; age 69.

Anneberg, Robert D., Cannon Beach, Ore.; North Pacific College of Oregon School of Dentistry, 1916; died January 20; age 71.

Atcheson, Rowland L., Seattle; North Pacific College of Oregon School of Dentistry, 1917; died October 16; age 69.

Austin, Alvin S., Pittsburgh; University of Pittsburgh School of Dentistry, 1923; died November 11; age 63.

Bachman, Virgil Y., Junction City, Kan.; Kansas City-Western Dental College, 1929; died October 9; age 56.

Baker, Robert P., Akron, Ohio; Ohio State University College of Dentistry, 1955; died December 7; age 35.

Bambrick, Harry C., Philadelphia; Temple University School of Dentistry, 1923; died January 17; age 64.

Barmack, David, Chicago; Northwestern University Dental School, 1915; died November 29; age 66.

Barr, George W., Boonville, Ind.; Indiana Dental College, 1908; died November 26; age 78.

Barton, Hafford W., Covington, Tenn.; University of Tennessee College of Dentistry, 1951; died October 1; age 39.

Bassett, Lyman D., Cobleskill, N. Y.; University of Buffalo School of Dentistry, 1918; died October 25; age 66.

Bauersfield, Virtus L., Wichita, Kan.; Kansas City Dental College, 1919; died October 13; age 65.

Bayer, Sidney D., Harvey, Ill.; Loyola University School of Dentistry, Chicago College of Dental Surgery, 1929; died December 17; age 54.

Beazley, Ernest V., Providence, R. I.; Tufts College Dental School, 1912; died February 1; age 72.

Beck, Harold B., Tuscumbia, Ala.; University of Nebraska College of Dentistry, 1931; died November 15; age 55.

Becker, Donald C., Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1926; died January 27; age 59.

Bell, George S., Chula Vista, Calif.; Chicago College of Dental Surgery, 1912; died November 19; age 71.

Bell, Morris S., Bridgeport, Conn.; Texas Dental College, 1920; died October 11; age 72.

Bell, Samuel A., Hammond, Ind.; Northwestern University Dental School, 1894; died December 23; age 96.

Bibee, Glen A., Fountain City, Tenn.; University of Tennessee College of Dentistry, 1925; died November 2; age 57.

Bigham, Eugene N., Pontotoc, Miss.; Atlanta Dental College, 1900; died October 26; age 85.

directory

OFFICERS

Charles H. Patton, D.D.S., President . . . . . 1702 Locust St., Philadelphia
John R. Abel, D.D.S., President-Elect . . . . . 10231 Santa Monica Blvd., Los Angeles
John B. Wilson, D.D.S., First Vice-President . . . . . 1427 San Marino Ave., San Marino, Calif.
Russell I. Todd, D.D.S., Second Vice-President . . . . . Western Union Bldg., Richmond, Ky.
Clarence S. Renouard, D.D.S., Third Vice-President . . . . . Phoenix Bldg., Butte, Mont.
Gerald D. Timmons, D.D.S., Speaker, House of Delegates . . . . 3223 N. Broad St., Philadelphia
Harold Hillenbrand, D.D.S., Secretary . . . . . 222 E. Superior St., Chicago
H. B. Washburn, D.D.S., Treasurer . . . . . Lowry Medical Arts Bldg., St. Paul
Lon W. Morrey, D.D.S., Editor . . . . . 222 E. Superior St., Chicago

BOARD OF TRUSTEES

John S. Eilar, D.D.S., 1963, Twelfth District . . 7 Medical Arts Sq., N.E., Albuquerque, N.Mex.
Edward F. Mimmack, D.D.S., 1963, Second District . . . . . 191 North St., Buffalo, N.Y.
Fritz A. Pierson, D.D.S., 1963, Eleventh District . . . . . Federal Securities Bldg., Lincoln, Neb.
Roger K. Trueblood, D.D.S., 1963, Thirteenth District . . 1611 N. Second Ave., Glendale, Ariz.
Aloyse E. Kopp, D.D.S., 1962, Ninth District . . . . . Wells Bldg., Milwaukee
William A. Garrett, D.D.S., 1962, Fifth District . . . . . Candler Bldg., Atlanta, Ga.
Laurence L. Lathrop, D.D.S., 1962, Third District . . . . . 24 W. Fourth St., Emporium, Pa.
Paul K. Musselman, D.D.S., 1962, Fourth District . . . . . 143 W. Main St., Newark, Del.
Robert J. Wells, D.D.S., 1962, Eighth District . . . . . 1525 E. 53rd St., Chicago
Arthur W. Easton, D.M.D., 1961, First District . . . . . 12 Pearl St., Norway, Maine
Maynard K. Hine, D.D.S., 1961, Seventh District . . . . . 1121 W. Michigan St., Indianapolis
E. Jeff Justis, D.D.S., 1961, Sixth District . . . . . Exchange Bldg., Memphis, Tenn.
Henry M. Willits, D.D.S., 1961, Tenth District . . . . . Roshek Bldg., Dubuque, Iowa

ASSISTANT SECRETARIES

C. Gordon Watson, D.D.S., 222 E. Superior St., Chicago
Gory N. Casto, Jr., D.M.D., 222 E. Superior St., Chicago
Bernard J. Conway, LL.B., Legal Affairs, 222 E. Superior St., Chicago
J. Roy Doty, Ph.D., Research and Therapeutics, 222 E. Superior St., Chicago
C. Willard Camalier, D.D.S., Washington Office, 806 Connecticut Ave., N.W., Washington, D.C.

BUREAUS

Audiovisual Service: Daryl I. Miller, Director, 222 E. Superior St., Chicago

Dental Health Education: Perry J. Sandell, M.A., Director, 222 E. Superior St., Chicago

Economic Research and Statistics: B. D. Moen, M.A., Director, 222 E. Superior St., Chicago

Library and Indexing Service: Donald A. Washburn, D.D.S., Director, 222 E. Superior St., Chicago

Membership Records: Georgia Christman (Mrs.), Director, 222 E. Superior St., Chicago

Public Information: Peter C. Goulding, B.A., Director, 222 E. Superior St., Chicago

COUNCILS

Constitution and Bylaws: C. M. Taylor, D.D.S., Chm., Esperson Bldg., Houston, Texas

Dental Education: Leslie M. FitzGerald, D.D.S., Chm., Roshek Bldg., Dubuque, Iowa

Dental Health: R. W. Openshaw, D.D.S., Chm., 6703 Melrose Ave., Los Angeles

Dental Research: W. F. Swanson, D.D.S., Chm., University of Pittsburgh, School of Dentistry, Pittsburgh
Sholom Pearlman, D.D.S., M.S., Secy., 222 E. Superior St., Chicago

Dental Therapeutics: Floyd D. Ostrander, D.D.S., Chm., University of Michigan Dental School, 625 E. Liberty, Ann Arbor, Mich.
J. Roy Doty, Ph.D., Secy., 222 E. Superior St., Chicago

Dental Trade and Laboratory Relations: J. Eugene Ziegler, D.D.S., Chm., 3875 Wilshire Blvd., Los Angeles
John P. Noone, LL.B., Secy., 222 E. Superior St., Chicago

Federal Dental Services: Thomas F. Powers, D.D.S., Chm., 819 Park Ave., Plainfield, N.J.
Herbert C. Lassiter, LL.B., Secy., 222 E. Superior St., Chicago

Hospital Dental Service: O. J. McCormack, D.D.S., Chm., Keith Theatre Bldg., Syracuse, N.Y.
Gerard J. Casey, D.D.S., Secy., 222 E. Superior St., Chicago

Insurance: Harold M. Flickinger, D.D.S., Chm., P.O. Box 9, Siloam Springs, Ark.
Herbert C. Lassiter, LL.B., Secy., 222 E. Superior St., Chicago

International Relations: Carl L. Sebelius, D.D.S., Chm., Division of Dental Health, State Department of Public Health, Cordell Hull Bldg., Nashville, Tenn.
Gory N. Casto, Jr., D.M.D., Secy., 222 E. Superior St., Chicago

Journalism: Isaac Sissman, D.D.S., Chm., Jenkins Arcade, Pittsburgh
Velma M. Child (Mrs.), Secy., 222 E. Superior St., Chicago

Judicial: C. E. Rutledge, D.D.S., Chm., 2500 Bissell Ave., Richmond, Calif.
Bernard J. Conway, LL.B., Secy., 222 E. Superior St., Chicago

Legislation: Matthew Besdine, D.D.S., Chm., 1182 Dean St., Brooklyn
Harvey Sarner, LL.B., Asst. Secy., 222 E. Superior St., Chicago

National Board of Dental Examiners: Harry Blechman, D.D.S., Chm., 205 E. 78th St., New York
Grace Parkin (Mrs.), B.A., B.S., Secy., 222 E. Superior St., Chicago

Relief: H. R. Bleier, D.D.S., Chm., 4177 N. Oakland Ave., Milwaukee

Scientific Session: Jarvis Williams, D.D.S., Chm., 6535 Wenonga Terrace, Kansas City 15, Mo.
Gory N. Casto, Jr., D.M.D., Secy., 222 E. Superior St., Chicago

SECTION CHAIRMEN

Anesthesiology: Harry M. Seldin, D.D.S., 57 W. 57th St., New York

Operative Dentistry: John H. Mosteller, D.D.S., 1729 Springhill Ave., Mobile, Ala.

Oral Surgery: Gustav O. Kruger, D.D.S., Georgetown University School of Dentistry, 3900 Reservoir Rd., N.W., Washington 7, D.C.

Orthodontics and Oral Development: Michael Maxian, D.D.S., 211 Park Ave., Manhasset, L.I., New York

Pedodontics: Norman Olsen, D.D.S., 636 Church St., Evanston, Ill.

Periodontics: Claud M. Fraleigh, D.D.S., School of Dentistry, West Virginia University, Morgantown, W.Va.

Practice Administration: Clarence E. Rutledge, D.D.S., 2500 Bissell St., Richmond 2, Calif.

Prosthodontics, Complete: Philip G. Vierheller, D.D.S., 818 Olive St., St. Louis 1

Prosthodontics, Partial: John F. Johnston, D.D.S., Indiana University School of Dentistry, 1121 W. Michigan St., Indianapolis 2

Public Health: John K. Peterson, D.D.S., Division of Dental Health, North Dakota State Department of Health, 1202 Third St., N., Bismarck, N.D.

Research: Seymour J. Kreshover, D.D.S., National Institute of Dental Research, Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bethesda 14, Md.

Roentgenology: Arnol R. Neely, D.M.D., University of Oregon Dental School, 611 S.W. Campus Dr., Sam Jackson Park, Portland, Ore.

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHitehall 4-6730
LON W. MORREY, D.D.S., *Editor* DONALD H. ROWCLIFFE, JR., B.S., C.P.A., *Business Manager*

All expressions of opinion and statements of supposed fact are published on the authority of the writer over whose signature they appear and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. Articles are accepted with the understanding that they have not been published previously and that they are submitted solely to The Journal. The Journal of the American Dental Association is indexed in the Index to Dental Literature and, in part, in the Index Medicus, Biological Abstracts and Chemical Abstracts.

Advertising copy must conform to the official standards established by the American Dental Association. Advertising forms close the 20th of the second month preceding issue. Rates and other information pertaining to advertising should be addressed to: John J. Hollister, director of Advertising and Exhibits. Notice of change of address should be received one month before the change is to be effective. Orders for reprints of Journal articles must be received by the Business Manager's office not later than the 15th of the month of issue in order to secure advantage of the lowest possible prices. Orders received after this date are subject to special quotation.

In direct testimony before a Congressional Committee, an official of the American Dental Association has stated:

"*Adequate scientific evidence has not yet been produced in support of special decay-preventive claims made for many nationally advertised dentifrices.*"

This is why the makers of Kolynos say:

Let's Stop Cheating Our Children!

FOR CENTURIES, Man has searched for dental "cure-alls"... either "short cuts" or "magic" substances he could rub on his teeth to keep them free from decay. The American Dental Association states no such "short cut" or "magic" substance exists and, in the home, the only proven way for a toothpaste to prevent tooth decay is to brush promptly after eating.

The makers of Kolynos feel the public should be aware of this truth: *unless parents insist on proper brushing, they are cheating their children of the dental health they deserve!*

Kolynos avoids "miracle ingredient" claims and concentrates on cleaning action. Kolynos therefore announces its finest achievement... the new Super-White formula, with *three* cleansing ingredients instead of the usual *two*. Brushing with it effectively removes food residues that lead to cavities. Used regularly, Kolynos removes film and surface stains... gives naturally whiter, brighter teeth. And Kolynos costs less... two giant tubes, only 69 cents.

Only a dentist can clean teeth more thoroughly.

announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

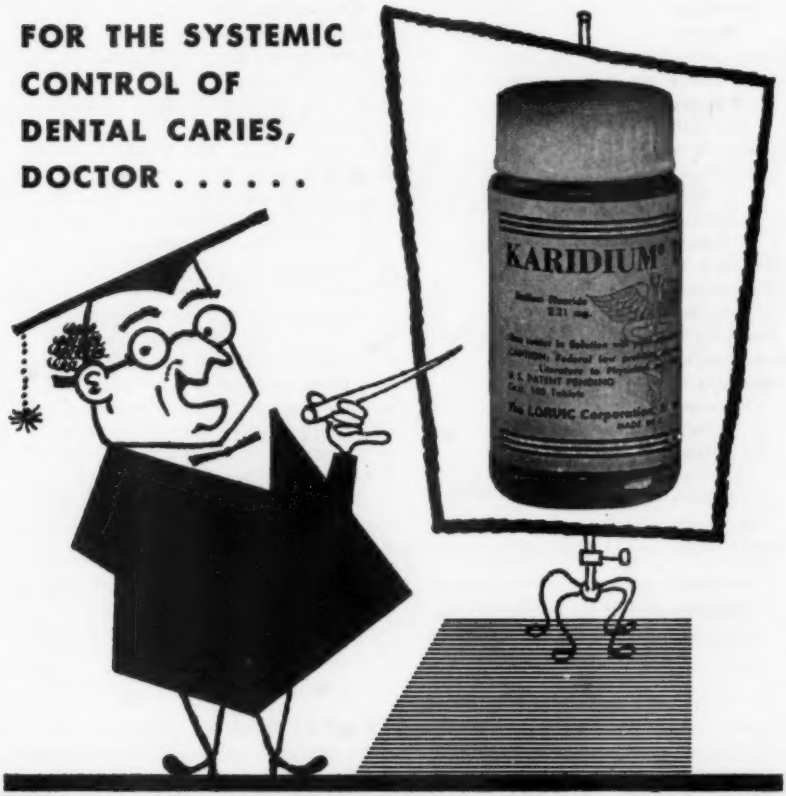
One-Hundred and Second Annual Session	October 16-19, 1961	Philadelphia
One-Hundred and Third Annual Session	October 29-November 1, 1962	Miami Beach, Fla.
One-Hundred and Fourth Annual Session	October 14-17, 1963	Atlantic City, N.J.
One-Hundred and Fifth Annual Session	November 9-12, 1964	San Francisco
One-Hundred and Sixth Annual Session	November 8-11, 1965	Las Vegas, Nev.

MEETINGS OF CONSTITUENT SOCIETIES

State	*Date*	*Place*	*Secretary and Address*
Alabama	Apr. 14-18	Birmingham	C. R. Crook, Professional Center, Montgomery
Alaska	July 10-12	Anchorage	W. E. Alexander, 406 G St., Anchorage
Arizona			J. F. Vaughn, 2727 N. Central Ave., Phoenix
Arkansas	Apr. 8-11	Little Rock	D. M. Hamm, Box 89, Clarksville
California	Apr. 8-11	San Francisco	F. H. Romick, 518 Sutter St., San Francisco 2
S. California	Apr. 16-18	Los Angeles	C. D. Honig, 903 Crenshaw Blvd., Los Angeles 19
Colorado	Oct. 1-4	Colorado Springs	G. H. Siersma, 903 Republic Bldg., Denver 2
Connecticut			E. S. Arnold, 37 Linnard Rd., W. Hartford
Delaware	June 9, 10	Wilmington	W. W. Flanagan, Jr., 309 S. State, Dover
Dist. of Columbia			B. D. Mattox, 1835 Eye St., N.W., Washington 6
Florida			E. M. Farber, 518 Tampa St., Tampa
Georgia	Oct. 1-4	Atlanta	F. M. Butler, Jr., 307 Southern United Bldg., Macon
Hawaii	June 18-22	Honolulu	J. H. Dawe, 291 Alexander Young Bldg., Honolulu 13
Idaho	Sept. 4-6	Sun Valley	L. L. Nissen, 4th St. and Boulevard, Idaho Falls
Illinois			P. W. Clopper, 632 Jefferson Bldg., Peoria
Indiana			C. L. Howell, 1012 Hume Mansur Bldg., Indianapolis 4
Iowa			H. N. Hake, 639 Insurance Exchange Bldg., Des Moines 9
Kansas			F. A. Richmond, Brotherhood Bldg., Kansas City 1
Kentucky	Apr. 1-4	Louisville	A. B. Coxwell, Jr., 2208 Dundee Rd., Louisville 5
Louisiana			J. S. Bernhard, 231 Atkins Ave., Shreveport 26
Maine	June 15-17	Rockland	S. M. Gower, 6 Coburn Ave., Skowhegan
Maryland			W. Schunick, 19 Medical Arts Bldg., Baltimore 1
Massachusetts			H. E. Tingley, 227 Commonwealth Ave., Boston
Michigan	Apr. 9-11	Grand Rapids	F. Wertheimer, Michigan Dept. of Health, Lansing
Minnesota	Apr. 2-4	St. Paul	C. V. E. Cassel, 2236 Marshall Ave., St. Paul 4W
Mississippi	June 25-28	Biloxi	M. C. O'Keefe, Medical Arts Bldg., Jackson 2

NOW—Also Available in Liquid!!

FOR THE SYSTEMIC CONTROL OF DENTAL CARIES, DOCTOR . . . . . .



KARIDIUM

TABLETS ®

Each tablet yields one milligram fluoride ion. May be taken as an aspirin or dissolved in water or fruit juice.

Cooperation by the parents is essential for maximum reduction of dental caries and should be stressed. Instruction that sodium fluoride tablets should be taken conscientiously throughout the period of tooth formation is important.

THE LORVIC CORPORATION

5553 EASTON AVENUE • ST. LOUIS 12, MISSOURI

Canadian Distributor: Professional Pharmaceutical Corp., Montreal 26, Quebec

State	Date	Place	Secretary and Address
Missouri			E. D. Suggett, Merchants Bank Bldg., Jefferson City
Montana			R. C. Ritter, 1236 N. 28th St., Billings
Nebraska			F. A. Pierson, Federal Securities Bldg., Lincoln
Nevada			O. M. Seifert, 821 Ryland Ave., Reno
New Hampshire	June 18-20	Whitefield	F. E. Williams, 517 Milton St., Manchester
New Jersey	May 20-23	Atlantic City	J. G. Carr, 407 Cooper St., Camden 2
New Mexico			E. P. Purtell, 2917 Santa Cruz Ave., S.E., Albuquerque
New York			C. A. Wilkie, 268 Ashland Pl., Brooklyn 17
North Carolina			S. B. Towler, P.O. Box 11065, Raleigh
North Dakota	Sept. 17-19	Fargo	D. R. Perry, Box 866, Bismarck
Ohio	Nov. 5-8	Columbus	E. G. Jones, 185 E. State St., Columbus
Oklahoma			W. C. Hopkins, 210 Plaza Court Bldg., Oklahoma City
Oregon	May 7-10	Portland	T. D. Holder, Selling Bldg., Portland
Panama C. Z.			H. L. Mertz, Jr., P.O. Box 1417, Balboa
Pennsylvania			I. Sissman, 217 State St., Harrisburg
Puerto Rico	Oct. 21-23	San Juan	R. Gonzalez R., Box 10452, Caparra Heights
Rhode Island	Jan. 14	Providence	E. Z. Radlo, 901 Union Trust Bldg., Providence
South Carolina			J. E. Wallace, 1506 Gregg St., Columbia
South Dakota			R. E. Decker, 2909 Poplar Dr., Sioux Falls
Tennessee			K. P. Ezell, 210 23rd Ave., N., Nashville 5
Texas			C. A. McMurray, 3707 Gaston Ave., Dallas 10
Utah			R. C. Dalgleish, 1554 Princeton Ave., Salt Lake City
Vermont	June 22-24	Vergennes	E. C. Woods, 128 Merchants Row, Rutland
Virginia			M. E. Henderson, Shenandoah Bldg., Roanoke 11
Washington			R. V. Tucker, 417 Grosvenor House, 500 Wall St., Seattle 1
West Virginia	July 23-26	White Sulphur Springs	P. H. Loflin, 109 E. Main St., Beckley
Wisconsin	Apr. 30-May 2	Milwaukee	C. J. Baumann, Jr., 704 W. Wisconsin Ave., Milwaukee
Wyoming	June 15-17	Laramie	T. J. Drew, State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary and Address
Alabama	June 25-30* June 26†	Birmingham	W. L. Smith, 524 Chestnut St., Gadsden
Alaska	July 18-21*†	Fairbanks	J. E. Miller, 1000 Fireweed Lane, Anchorage
Arizona	June 18	Florence	R. K. Trueblood, 1611 N. Second Ave., Glendale
Arkansas	June 18-23*†	Little Rock	G. Cone, 113 S. Pecan St., Osceola
California	June 12-17 June 26-July 1	San Francisco Los Angeles	T. R. Flinn, 1021 O St., Rm. A-597, Sacramento 14
Colorado	June 18-24‡		J. E. Cummings, 903 Republic Bldg., Denver 2
Connecticut	June 18-20* June 20, 21†	Bridgeport	M. J. Zazzaro, 99 Pratt St., Hartford 3
Delaware	June 19*† June 20-22*†	Philadelphia Wilmington	J. F. Maguire, 1200 N. Van Buren St., Wilmington
Dist. of Columbia	June 6-8*	Washington	J. A. Madden, 1740 Massachusetts Ave., N.W., Washington 11
Florida	July 2-12* July 2, 3†	Jacksonville	R. P. Taylor, Jr., P.O. Box 2913, Jacksonville 3
Georgia			H. M. Robertson, 206 Donehoo St., Statesboro
Hawaii	Aug. 17-21	Honolulu	F. S. Kagihara, 1644 S. King St., Honolulu
Idaho	June 19-22*†‡		W. M. Smith, 305 Fort St., Boise
Illinois			R. I. Humphrey, 185 N. Wabash Ave., Chicago
Indiana	June 6-9*†	Indianapolis	C. A. Frech, Gary National Bank Bldg., Gary

how characterized should a characterized tooth be?

Two Tests

No characterized denture can be considered successful unless it passes the two tests of (1) being so realistic as to defy detection, and (2) being acceptable to the patient.

Requirements for Realism

Myerson's new AEsthetic Characterized anterior teeth in multi-fired porcelain are the result of twenty years of leadership and experience in effective characterization*. Hand fabricated with the utmost attention to *realistic* details, their characterization includes simulated fillings, decalcification areas, irregular incisals, neck stains, line stains, incisal stains on lowers, even "graduated" characterization that becomes heavier with darker shades.

Acceptability to the Patient

These effects are so skillfully incorporated into Myerson's AEsthetic Characterized teeth that dentures made with these teeth are most convincingly natural-looking and actually enhance the patient's appearance. For this reason, you will find that Myerson's AEsthetic Characterized teeth create ready acceptance for characterization even though a higher fee is usually involved.

*The first ready-made characterized tooth was developed by Myerson in 1940.

To see Myerson's AEsthetic Characterized teeth and to obtain additional information, write:

Myerson Tooth Corporation

69 Hamilton Street, Cambridge 39, Mass.

State	Date	Place	Secretary and Address
Iowa	June 5-8*†	Iowa City	P. A. Hahn, Farmers & Merchants Bank Bldg., Burlington
Kansas	June 15-17*†	Kansas City, Mo.	R. C. Windscheffel, Medical Arts Bldg., Smith Center
Kentucky	June 12-15*†	Louisville	J. J. Kelly, 102 W. Madison St., Franklin
Louisiana			A. R. deNux, 617 N. Monroe St., Marksville
Maine	June 19-21‡		A. H. Garcelon, 133 State St., Augusta
Maryland	June 12-14	Baltimore	F. J. Bryce, 303 Granville Dr., Silver Spring
Massachusetts	June 5-7*‡ June 8†‡ June 8, 9*†‡		R. R. Racicot, 33 State House, Boston
Michigan	June 11-17	Ann Arbor	J. L. Champagne, 3714 W. McNichols Rd., Detroit 21
Minnesota	June 12-16* June 12, 13†	Minneapolis	E. A. Nelson, 2236 Marshall Ave., St. Paul 4W
Mississippi	June 18-20	Jackson	C. V. Pettey, Jr., Box 387, Magnolia
Missouri	June 5-7* June 5† June 12, 13*† June 8-10* June 8† June 12, 13*†	Kansas City Kansas City Kansas City St. Louis St. Louis St. Louis	R. R. Rhoades, Central Trust Bldg., Jefferson City
Montana			E. A. Cogley, Medical Arts Bldg., Great Falls
Nebraska	June 12-16††	Lincoln Omaha	H. E. Weber, Stuart Bldg., Lincoln
Nevada			R. Whitehead, 40 W. First St., Reno
New Hampshire	June 15, 16	Boston	L. U. Bergeron, 211 High St., Somersworth
New Jersey	June 1, 2*† June 8, 9*† June 12, 13*† June 19, 20 June 22, 23*†	Philadelphia New York Teaneck Trenton Philadelphia	C. J. Schweikhardt, 150 E. State St., Trenton 8
New Mexico	June 19-24*†‡		G. D. Hastain, Box 1007, Clovis
New York	June 22, 23*† June 27, 28† June 27-30*	New York Buffalo New York Albany Syracuse Buffalo Rochester New York Albany Syracuse Buffalo Rochester	D. F. Wallace, 23 S. Pearl St., Albany 7
North Carolina	June 26-30*†	Chapel Hill	J. H. Guion, Doctors Bldg., Charlotte 7
North Dakota	July 10-14	Fargo	F. A. Maides, First National Bank Bldg., Grand Forks
Ohio	June 12-14* June 14† June 15, 16*†‡ June 19-21* June 22-24*	Columbus Columbus Columbus Cleveland	D. E. Bowers, 322 E. State St., Columbus 15
Oklahoma	June 19-21* June 20, 21†	Oklahoma City	W. H. Stephens, Plaza Court Bldg., Oklahoma City
Oregon	June 5-8	Portland	C. Wheeler, Medical Arts Bldg., Portland
Pennsylvania	June 7† June 7, 8* June 21† June 21, 22*	Pittsburgh Philadelphia Philadelphia Philadelphia Philadelphia	P. Swanson, 8111 Jenkins Arcade, Pittsburgh
Puerto Rico			J. Mercado C., Comercio St., #452, San Juan
Rhode Island			A. E. Turcone, 298 Broadway, Providence
South Carolina	June 22-24‡		W. J. Brockington, 2827 Millwood Ave., Columbia 1
South Dakota	June 25-28*†	Sioux Falls	W. P. Powell, Box 409, Vermillion
Tennessee	June 12-16	Memphis	C. R. Aita, Bennie-Dillon Bldg., Nashville
Texas	June 11-15† June 11-18*	Houston	R. T. Weber, Capital National Bank Bldg., Austin 16
Utah	June 19-23*‡		M. O. Hutchins, 230 E. Tabernacle, St. George
Vermont	June 26-28*†	Burlington	B. S. Pinney, 215 Pearl St., Burlington
Virginia	June 12-17* June 14, 15†	Richmond	J. M. Hughes, Medical Arts Bldg., Richmond

Let this New

HANAU *ELECTRONIC TIMER*

Modernize your X-RAY

Now your X-ray can take pictures as fast as the latest model machines. The New Hanau Electronic Timer lets you modernize your instrument to use the new faster films . . . and the cost is surprisingly modest.

You can quickly select the exact exposure you require (range 1/30 second to 6 seconds, with 22 other intermediate exposures) and be assured of consistent accuracy because of precise electronic control.

The shorter exposures coupled with the use of faster films, plus the use of a remote installation, all combine to minimize the problem of cumulative radiation absorption.

The Hanau Electronic Timer is available for most X-ray machines. It can be mounted to the column of your present X-ray or wall mounted even in another room or other remote location.

Talk to your dealer or mail coupon for full information.

HANAU
ENGINEERING CO., INC.
1233 Main St. • Buffalo 9, New York

Please send complete information on the Hanau Electronic Timer.

Name_____

Address_____

City_____ Zone____ State_____

State	Date	Place	Secretary and Address
Washington	June 19-22	Seattle	W. B. Lamey, Medical Dental Bldg., Everett
West Virginia	June 19-21* June 20, 21†	Morgantown	A. B. Drake, 1355 Fourth Ave., Huntington
Wisconsin	June 5-9*†	Milwaukee	S. F. Donovan, Tomah
Wyoming	June 18-22*†	Rawlins	W. J. Ryan, Boyd Bldg., Cheyenne

**Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations. ††Hygienist examination at any time.*
Most states require application to be in 30 days prior to examination date.

NATIONAL EXAMINATIONS

Name	Date	Place	Secretary and Address
American Board of Dental Public Health	Oct. 12, 13	Philadelphia	D. J. Galagan, Divn. of Dental Public Health, PHS. Dept. of Health, Education and Welfare, Washington, D.C.
American Board of Oral Pathology	Dec. 9, 10		W. G. Shafer, Indiana University, School of Dentistry, 1121 W. Michigan St., Indianapolis 2
American Board of Oral Surgery	Dec. 4 Mar. 22-27	Chicago Chicago	L. M. FitzGerald, Roshek Bldg., Dubuque, Iowa
American Board of Orthodontics	Apr. 23-28	Los Angeles	A. W. Moore, University of Washington, School of Dentistry, Seattle 5
American Board of Pedodontics	Oct. 30-Nov. 2	Ann Arbor, Mich.	R. L. Ireland, College of Dentistry, University of Nebraska, Lincoln 8, Neb.
American Board of Periodontology			B. O. A. Thomas, 668 Homer Ave., Palo Alto, Calif.
American Board of Prosthodontics	Aug. 14-19	Chicago	C. H. Jamieson, David Whitney Bldg., Detroit 26
Council on Dental Education, Dental Aptitude Tests	Oct. 6, 7 Jan. 5, 6 Apr. 27, 28		Secretary, 222 E. Superior St., Chicago 11
National Board of Dental Examiners	Dec. 4, 5		Grace Parkin, 222 East Superior St., Chicago 11

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secretary or Chairman and Address
American Academy of Gold Foil Operators	Oct. 11-13	Philadelphia	C. C. Latham, P.O. Box 266, Coronado, Calif.
American Academy of the History of Dentistry	Oct. 13	Philadelphia	M. B. Asbell, 25 Haddon Ave., Camden, N.J.
American Academy of Implant Dentures	Oct. 12-15	Philadelphia	A. N. Cranin, 2120 Ocean Ave., Brooklyn 29
American Academy of Maxillofacial Prosthetics	Oct. 11-13	Philadelphia	M. C. Cleaver, 2330 Linwood Ave., Coytesville, Fort Lee, N.J.
American Academy of Oral Pathology	Apr. 6-8	Ann Arbor, Mich.	R. J. Gorlin, School of Dentistry, University of Minnesota, Minneapolis
American Academy of Oral Roentgenology	Oct. 14, 15	Philadelphia	T. S. Grant, University of California Medical Center, San Francisco 22
American Academy of Periodontology	Oct. 20-25	Bermuda Cruise	C. E. Chamberlain, 1101 N. North St., Peoria, Ill.
American Academy of Physiologic Dentistry	June 12-14	Duluth, Minn.	E. A. Lawton, 2217 Lincoln Way West, South Bend, Ind.
American Association of Dental Editors	Oct. 14	Philadelphia	E. M. Ebert, 10058 Ewing Ave., Chicago
American Association of Dental Examiners	Oct. 13, 14	Philadelphia	C. J. Schweikhardt, 20 Durand Rd., Maplewood, N.J.

2 symposia in the July Number

Local Anesthesia & Analgesia
Morgan L. Allison, D.D.S.

and

Oral Roentgenology
Seymour H. Yale, D.D.S.

DENTAL CLINICS *of* NORTH AMERICA

Three times a year the widely-used Dental Clinics of North America bring to your desk a 250-page illustrated Symposium of vital and current interest. You will find each page packed with sound, concise, clinical advice from leading dental centers and outstanding men in the field—telling you *what* to do, *when* to do it and *how* to do it.

The July Number gives you up-to-date, clinically useful information on adjunctive and diagnostic procedures you perform every day.

20 articles bring you stimulating discussions on: a clinical investigation of mepivacaine (carbocaine)—techniques of premedication, sedation and chemanesia—how to get the most out of dental X-ray equipment—improving quality of films—decreasing exposure hazards to patients and office personnel.

The Dental Clinics are books, not magazines. They contain no advertising, only usable, clinical information applicable to your daily practice. They are sold only on a yearly basis (3 numbers—March, July & Nov.) Per year—$14.

PARTIAL CONTENTS

ANESTHESIA AND ANALGESIA

Action of Local Anesthetic Agents—*Stanley C. Harris*
Local Anesthesia: History; Potential Toxicity; Clinical Investigation of Mepivacaine—*Wayne Hiatt*
Toxicity of Local Anesthetics in Man—*Francis F. Foldes and Pearl G. McNall*
Vasoconstrictors in Local Anesthetics—*Jack G. Bishop, Homer L. Dorman and J. Lester Matthews*
Premedication in Dentistry—*Niels Bjorn Jorgensen and Forrest Leffingwell*
Chemanesia Plus Analgesia for the Ambulatory Dental Patient—*Leonard M. Monheim and Harold J. Zubrow*
Local Anesthesia in Endodontics—*Neal W. Chilton*
The Control of Pain and Apprehension and Use of Local Anesthesia in Periodontics—*Lewis Fox*
Hypnosis as Anesthesia—*Sidney Epstein*

ORAL ROENTGENOLOGY

Radiation Control in the Dental Office—*Seymour H. Yale*
Effective Use of the Darkroom—*Jack D. Carr and Richard D. Norman*
Technical Factors That Control Radiographic Density—*Albert G. Richards*
Roentgenographic Evaluation of Radiopaque Lesions of the Jaw—*H. G. Poyton*
Roentgenographic Diagnosis of Periapical Lesions—*Donald T. Waggener*
Practical Evaluation of Techniques and Interpretation in the Roentgenographic Examination of Temporomandibular Joints—*William J. Updegrave*
Utilization of Extraoral Roentgenographic Techniques in General Dental Practice—*Lincoln R. Mason-Hing*
Using X-rays in Case Presentation—*C. E. Crandell*
Radioactive Isotopes in Dentistry—*Henry Jeffay*

W. B. SAUNDERS COMPANY, West Washington Square, Philadelphia 5, Pa.
ADA 6-61

Send for 30-day examination and charge:

☐ **The Dental Clinics of North America beginning July, 1961. . . . $14.00 Per Year**

Name .....

Address ..... **Zone**.....

Name	*Date*	*Place*	*Secretary or Chairman and Address*
American Association of Industrial Dentists	Apr. 10-12	Los Angeles	E. R. Aston, Pennsylvania Dept. of Health, P.O. Box 90, Harrisburg
American Association of Orthodontists	Apr. 16-21	Denver	E. E. Shepard, 225 S. Meramec Ave., St. Louis 5
American Association of Public Health Dentists	Oct. 14	Philadelphia	A. H. Trithart, Montana State Board of Health, Helena
American College of Dentists	Oct. 14, 15	Philadelphia	O. W. Brandhorst, 4236 Lindell Blvd., St. Louis
American Dental Assistants Association	Oct. 16-19	Philadelphia	Mrs. E. Troutman, First National Bank Bldg., La Porte, Ind.
American Dental Hygienists' Association	Oct. 16-19	Philadelphia	M. E. Swanson, 100 E. Ohio St., Chicago 11
American Dental Society of Anesthesiology	Oct. 13-15	Philadelphia	H. A. Sultz, 1275 Delaware Ave., Buffalo 9
American Dental Society of Europe	June 24-30	Paris, France	J. P. Molony, 110 Harley St., London W.1, England
American Denture Society	Oct. 13, 14	Philadelphia	V. L. Steffel, 19 W. Fifth Ave., Columbus, Ohio
American Hypnodontic Society	June 18	New York	R. M. Ferber, 140 E. 56th St., New York
American Institute of Oral Biology	Nov. 6-10	Palm Springs, Calif.	M. L. Meyer, 2240 Channing Way, Berkeley 4, Calif.
American Public Health Association, Dental Health Section	Nov. 13-17	Detroit	D. F. Striffler, New Mexico Dept. of Public Health, 408 Galisteo St., Santa Fe
American Society for the Advancement of General Anesthesia in Dentistry	Oct. 23	New York	M. H. Feldman, 730 Fifth Ave., New York 19
American Society of Dentistry for Children	Oct. 13-15	Philadelphia	W. O. Young, 120 N. Capitol Blvd., Boise, Idaho
American Society of Oral Surgeons	Oct. 7-13	Bermuda Cruise	D. C. Trexler, 840 N. Lake Shore Dr., Chicago 11
Ark-La-Tex Dental Congress	Aug. 21	Shreveport, La.	G. Poulos, State National Bank Bldg., Texarkana, Ark.
Armed Forces Dental Officers Association	Oct. 15, 16	Philadelphia	W. Z. Kling, Medical Arts Bldg., San Antonio, Texas
Asian-Pacific Dental Conference (Third)	Oct. 17-22	Tokyo, Japan	H. Kawamura, Japan Dental Association, 4 Chome, Kudan, Chiyodaku, Tokyo, Japan
Association of American Women Dentists	Oct. 16	Philadelphia	J. Palancia, 1527 W. Passyunk Ave., Philadelphia
Australian Dental Congress (Sixteenth)	Aug. 14-18	Sydney, N.S.W.	D. Freeman, 185 Elizabeth St., Sydney, New South Wales
Austrian Dental Society, Centennial Jubilee Congress	Nov. 14-18	Vienna	S. Loos, Weihburggasse 10-12, Vienna I, Austria
Berkshire Conference in Oral Pathology and Periodontology (Twelfth)	June 18-22	Lenox, Mass.	I. Glickman, Tufts University School of Dental Medicine, 136 Harrison Ave., Boston 11
British Dental Association	June 18-23	Harrogate, U.K.	J. Peacock, 13 Hill St., Berkeley Sq., London W.1, England
California Academy of Periodontology	June 2-4	Reno, Nev.	V. J. Oulliber, 3798 Twenty-fifth St., San Francisco 10
Canadian Dental Association and Western Canada Dental Society	June 4-7	Saskatoon	N. F. Gropper, Canada Bldg., Saskatoon, Sask., Canada
Chicago Dental Society	Feb. 18-21	Chicago	K. S. Richardson, 30 N. Michigan Ave., Chicago
Czechoslovak Stomatologists, (Second Congress)	Sept. 12-15	Mariánské (Marienbad)	F. Urban, 26 Stomatologicka Klinika, Karlova nám. 32, Praga 2, Czechoslovakia
European Organization for Research on Fluorine and Dental Caries Prevention (ORCA)	July 5-8	London, England	H. R. Held, 18 Passage du Teraillet, Geneva, Switzerland

If you were an actor . . . you'd have a "stand-in".

If you were a baseball player . . . you'd have a "pinch-hitter".

But you're a dentist . . . and

there is no substitute for YOU . . .

or your income except through a well thought-out insurance program. The American Dental Association Group Accident and Health Insurance Plan is *"tailor-made"* to answer your problem.

As a participant of this progressive plan you will receive benefits for disability resulting from accident beginning from the first day or from sickness beginning with the eighth day regardless of any other insurance you now carry. And there are no restrictions on the way the money is used . . . for medical bills, food or continuing office expenses. *House confinement is not necessary to establish the continuance of compensable disability.*

For additional details write the Trustee of the Policy, Dr. Paul Zillmann, 29 Walden Avenue, Buffalo 11, New York or M. A. Gesner, Inc., 216 East Superior Street, Chicago 11, Illinois.

Issued exclusively by **National Casualty Company of Detroit**
through M. A. Gesner, Inc., 216 East Superior Street, Chicago 11, Illinois – Phone WHitehall 3-1525

SINCE THE NATIONAL CASUALTY COMPANY'S PLAN OF ACCIDENT AND HEALTH INSURANCE IS IN EFFECT ON A STATE SOCIETY BASIS IN NEW YORK, NEW JERSEY, CALIFORNIA, UTAH AND NEVADA, THE ASSOCIATION PLAN IS NOT AVAILABLE IN THOSE STATES.

Name	*Date*	*Place*	*Secretary or Chairman and Address*
European Orthodontic Society, (37th Congress)	Sept. 7-11	Bologna, Italy	Secretary of the Congress, via Marsili 15, Bologna, Italy
Fauchard Bicentenary	July 1, 2	Paris, France	M. Filderman, 67 rue de Tocqueville, Paris, France
Federation Dentaire Internationale, (49th Annual Session)	July 9-15	Helsinki, Finland	G. H. Leatherman, 35 Devonshire Pl., London W.1, England
French Congress of Stomatology (Seventeenth)	Oct. 23-28	Paris	Secrétariat, 17th Congrès Francais de Stomatologie, 20 passage Dauphine, Paris 6e, France
German Society for Dentistry, (89th Annual Meeting)	Oct. 13-15	Mainz	M. Hermann, Schlesische Strasse 18, Mainz, Germany
Greater New York Dental Meeting (Thirty-seventh)	Dec. 4-8	New York	Mrs. M. Purdy, 106-A Hotel Statler Hilton, New York 1
International Association of Dental Students	Aug. 21-27	London, England	D. H. Clark, Royal Dental Hospital, Leicester Sq., London W.C.2, England
International Dental Congress of Uruguay-Argentina	Nov. 12-19	Montevideo, Uruguay	J. C. Turell, Av. Agraciada 1464 (P. 13), Montevideo, Uruguay
International College of Dentists	Oct. 14, 15	Philadelphia	H. O. Westerdahl, 4829 Minnetonka Blvd., Minneapolis 16
Italian Dental and Maxillo-Facial Congress (Fourth)	June 3-11	Turin	Secretary, A.N.I.D.I., Via XX Settembre 8, Genoa, Italy
Italian Medical Dental Association, (35th Congress)	Dec. 8-12	Milan	P. Lalli, Via Bonifacio VIII, 22, Rome, Italy
Mexican Dental Association (Sixth biennial)	Nov. 19-23	Mexico City	C. J. Cornish, Sinaloa No. 9, Mexico 7, D.F.
Mid-Continent Dental Congress	Oct. 29-Nov. 1	St. Louis	J. E. Brophy, 8013 Maryland Ave., St. Louis 5
National Association of Seventh-Day Adventist Dentists	Oct. 12-14	Philadelphia	E. M. Collins, College of Medical Evangelists, School of Dentistry, Loma Linda, Calif.
National Dental Association	Aug. 6-10	Washington, D.C.	E. N. Jackson, P.O. Box 197, Charlottesville, Va.
New England Dental Society	Nov. 1, 2	Boston	W. F. O'Meara, 904 Main St., Hartford, Conn.
Northeastern Dental Society	June 4-7	Swampscott, Mass.	N. A. Emery, 291 Broadway, Lynn, Mass.
Northeastern Society of Orthodontists	Oct. 29-31	Rochester, N.Y.	D. Mossberg, 36 Central Park S., New York 19
Odontological Society of Western Pennsylvania	Oct. 31-Nov. 1	Pittsburgh	H. D. Butts, Jr., Jenkins Bldg., Pittsburgh 22
Peru National Dental Congress (Fifth) and First International Congress of Stomatology	Nov. 5-11	Lima	G. Roose C., Av. Pershing 155, San Isidro, Lima, Peru
Southeastern Society of Oral Surgeons	Apr. 27-29	Miami Beach, Fla.	E. H. Martin, 1900 Hayes St., Nashville 4, Tenn.
Southern Academy of Periodontology	June 11-13	Atlanta, Ga.	J. J. Morris, 101 Third St., N.E., Atlanta, Ga.
Spanish Society of Orthodontics (Seventh)	Apr. 27-30	Valencia	A. J. Cervera, Avda, Oeste, 29, Valencia, Spain
Swiss Dental Society, (75th Anniversary)	June 1-4	Basle	B. Jakubowitsch, Blumenrain 20, Basle, Switzerland
Women's Auxiliary to the American Dental Association	Oct. 16-19	Philadelphia	Mrs. G. G. Smith, 212 S. Third St., Kaysville, Utah

TORIT'S Model 27 Casting Machine

● stronger, denser castings ● finer margins, greater detail

● practically no fitting time ● less gold

Only the Torit "27" Centri-Vac Casting Machine offers the benefits of centrifugal force *plus* vacuum design. You can use fewer and smaller sprues, and less metal and sprue to any part of the case. In fact, perfect-fitting inlays can be made at the end of sprues as long as 6" (16 ga.).

Centrifugal force propels the molten metal directly into the mold cavity, instantaneously filling the mold. Gases which may be present in the mold cavity are entirely removed by the high vacuum attachment.

TORIT makes the difference

. . . and Torit makes many different dental products.

Torit's 707 Electric Furnace

This large-sized furnace easily takes a 3½" casting ring—yet attains any casting temperature in an average of only 80 minutes. Rheostat controlled temperature prevents failures in wax burn out by providing slow temperature rise, eliminating moisture.

Torit's Barr Vacuum Investing Unit

Makes dense, bubble-free investments in just one minute. Standardized, fool-proof procedures—an assistant can make investments perfectly. Can be used for die impregnation, stone mixes, or alginates. Completely equipped with casting ring and sprue formers. Optional attachment available for investing bridge castings.

For complete information, write

TORIT MANUFACTURING CO.

Dept. 120, 1133 Rankin St., St. Paul 16, Minn.

"They look wonderful! Not 'greyed-out' and artificial."

"My doctor explained why:

"It's because the Swissedent CR teeth that he uses reflect light just as natural teeth do. He says the reason why most of my friends' artificial teeth look grey in the mouth is because they are too highly translucent, which mine aren't, thank goodness!"

★ ★ ★

What** your **patients say about** their **restorations is vitally important to you. So — wouldn't it be a wise professional decision to use Swissedent Candulor CR teeth in** all **of your prosthetic cases?

Swissedent CR

VACUUM FIRED TEETH

are the only teeth specifically created for the dentogenic concept ...and Swissedenture service.

Ask your nearest Swissedent distributor:

373 North Western Ave., Los Angeles 4, Calif. / 185 North Wabash Ave., Chicago 1, Ill. / 480 Lexington Ave., New York 17, N.Y.

It's more than a toothbrush...

It's an ORAL B – the one brush that provides gentle brushing for gingival tissues and also cleans teeth thoroughly with minimum abrasion.

Like each dental instrument in your instrument cabinet, the ORAL B was designed to perform a specific job. The 2,500* softer, very slender filaments have smooth tops. Their gentle action helps prevent damage to gingival tissue while brushing at the gum line, where many tooth troubles start.

Make sure your patients have the advantage of regular daily care with a brush that can be used effectively on gums as well as teeth.

Prescribe an ORAL B. It does what a toothbrush ought to do! *ORAL B 60

1 texture... Firm enough for teeth, gentle enough for gums.

2 actions... Gentle brushing and thorough cleansing.

3 sizes... For every member of the family.

Write for your professional sample.

ORAL B COMPANY
San Jose, California • Toronto, Canada

Plan your operatory around AMERICAN MODULAR for greater efficiency, less day-end fatigue

To do your best professional work, you need a smoothly co-ordinated operatory that speeds your movements . . . reduces waste motion and fatigue. AMERICAN MODULAR cabinets have been designed to meet your needs—whether you work alone or with an assistant. Completely flexible, AMERICAN MODULAR is adaptable to every size and shape of room.

Planning service available

Your Hamilton representative will bring you a planning layout kit for easy step-by-step layout of AMERICAN MODULAR cabinets in **your** operatory. No obligation. **Write today!**

Hamilton

PROFESSIONAL AND SCIENTIFIC FURNITURE

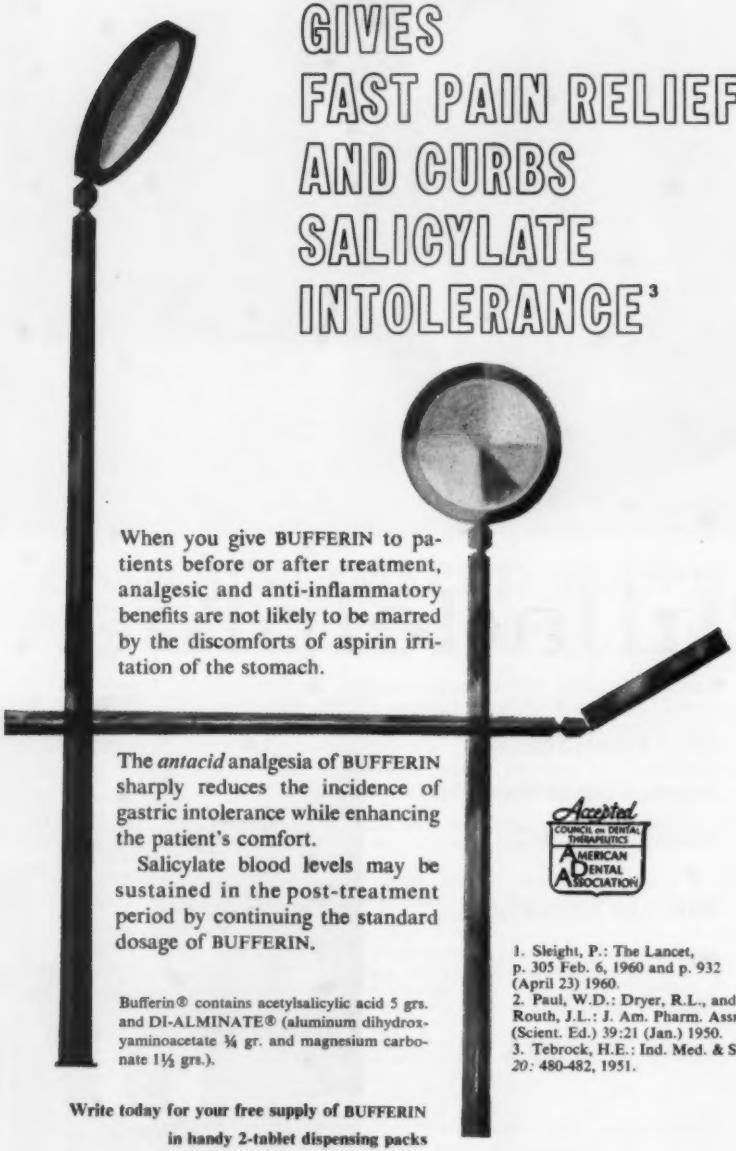
Hamilton Manufacturing Company, Two Rivers, Wisconsin

new dimensions in time and space efficiency for: physicians; dentists; industrial, hospital, school laboratories; draftsmen; printers; libraries; home laundries.

For dental salicylate therapy:

BUFFERIN®

GIVES FAST PAIN RELIEF[1,2] AND CURBS SALICYLATE INTOLERANCE[3]



When you give BUFFERIN to patients before or after treatment, analgesic and anti-inflammatory benefits are not likely to be marred by the discomforts of aspirin irritation of the stomach.

The *antacid* analgesia of BUFFERIN sharply reduces the incidence of gastric intolerance while enhancing the patient's comfort.

Salicylate blood levels may be sustained in the post-treatment period by continuing the standard dosage of BUFFERIN.

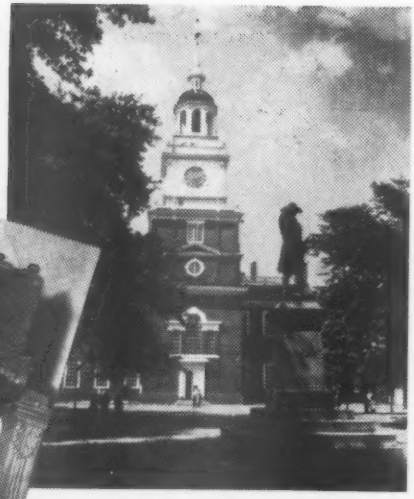
Bufferin® contains acetylsalicylic acid 5 grs. and DI-ALMINATE® (aluminum dihydroxyaminoacetate ¾ gr. and magnesium carbonate 1½ grs.).

Accepted COUNCIL on DENTAL THERAPEUTICS AMERICAN DENTAL ASSOCIATION

1. Sleight, P.: The Lancet, p. 305 Feb. 6, 1960 and p. 932 (April 23) 1960.
2. Paul, W.D.: Dryer, R.L., and Routh, J.L.: J. Am. Pharm. Assn. (Scient. Ed.) 39:21 (Jan.) 1950.
3. Tebrock, H.E.: Ind. Med. & Surg. *20:* 480-482, 1951.

Write today for your free supply of BUFFERIN in handy 2-tablet dispensing packs

Bristol-Myers Company, 630 Fifth Avenue, New York 20, New York



INDEPENDENCE HALL

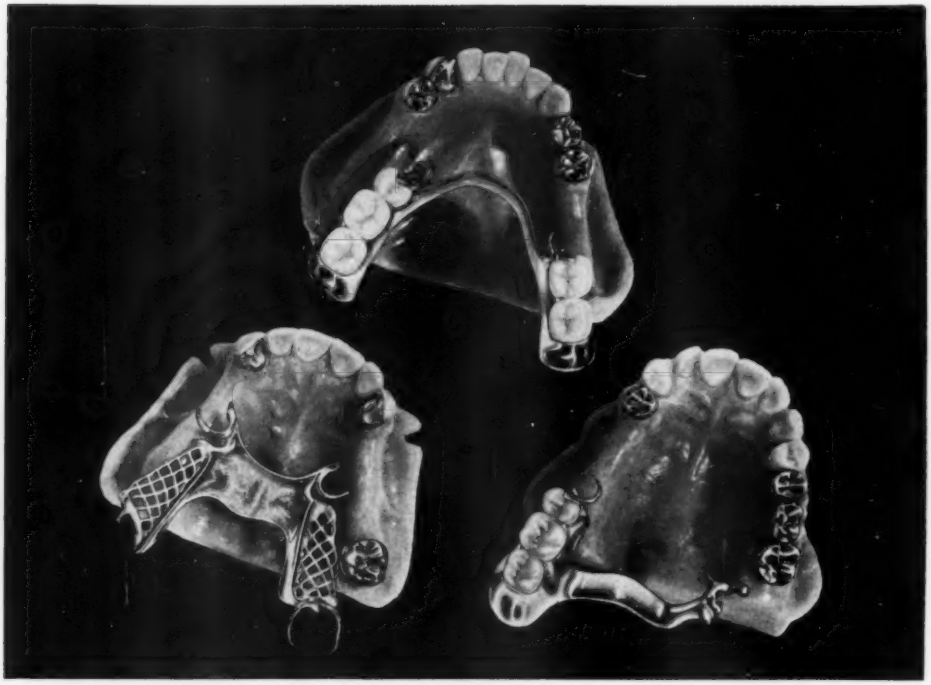
LIBERTY BELL

Philadelphia

102nd Annual Session
American Dental Association
October 16-19, 1961

Make your reservation
now using the
housing form in the
Journal of the A.D.A.

BETSY ROSS HOME



GAIN UNLIMITED SCOPE
THROUGH BOOS SERVICES

The scope of Boos skill in partial dentures, for example, ranges from conventional cases to the complicated restorations shown here. All types of restorations are included, which is an important factor in making your own practice unlimited in scope. Boos services are easily available. Write today for our mailing conveniences . . . including postpaid labels, airmail or 1st class.

FREE ESTIMATE SERVICE. Just send models and description. We will submit laboratory costs for various methods of construction.

TOP: Precision attachments—the finest, most functional retention for partials. Double abutment crowns are splinted for increased stability. Stabilizing lingual clasps are recessed for smooth lingual anatomy.

LEFT: Back-action clasps and recessed rests provide adequate retention without labial clasp display. Contours suitable for this type of clasp were established on the distal of the veneer crowns. Wide "Veri-Thin" Vitallium® palatal bar gives additional support and stability.

RIGHT: Fixed bridge on left side utilizes pontic in constructing precision attachment partial providing the free end saddle. Lingual clasp arms with attachments give added retention and lateral stability.

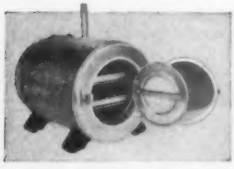
BOOS Henry P. Boos Dental Laboratories, Inc.
808 Nicollet Ave.. Minneapolis 40, Minn.

Branch Laboratories:
Medical Arts Bldg., Duluth, Minn. • *Equitable Bldg., Des Moines, Iowa*

Sure—we can capture your attention with the monkey...

but to hold your interest in our new product
...here are a few of the outstanding features
of the **Norelco®** **AUTOMATIC, DRY-HEAT STERILIZER**

• 100% DESTRUCTION OF THE HEPATITIS VIRUS* • COMPLETE ASEPSIS WITH NO DULLING OF INSTRUMENTS • BIG 3-TRAY CAPACITY (7" x 11") FOR GREATER CONVENIENCE • FAST, SIMPLE, THERMOSTAT-CONTROLLED OPERATION • GREATER ECONOMY... HANDSOME APPEARANCE • GREATER SAFETY...NO SPECIAL PRECAUTIONS NECESSARY • ONLY **$185.00** *(less Monkey, of course)*

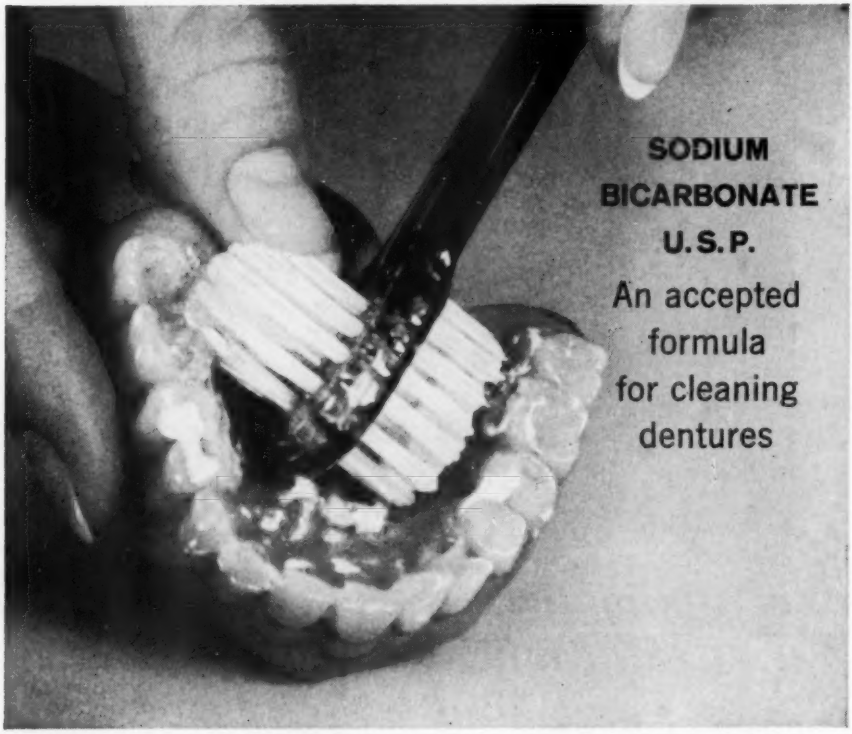


...And for even faster sterilization plus fast cooling ...the Norelco RECIRCULATING-AIR, DRY-HEAT STERILIZER. Filtered air circulated over contents, provides uniform heating of load, plus extremely rapid sterile cooling.....Price **$250.00**

**Write for Biological Testing Company report and additional details.*

NORTH AMERICAN PHILIPS COMPANY, INC. • Dental Division • **525 West 52nd Street, New York 19, N. Y.**

Denture Cleaner

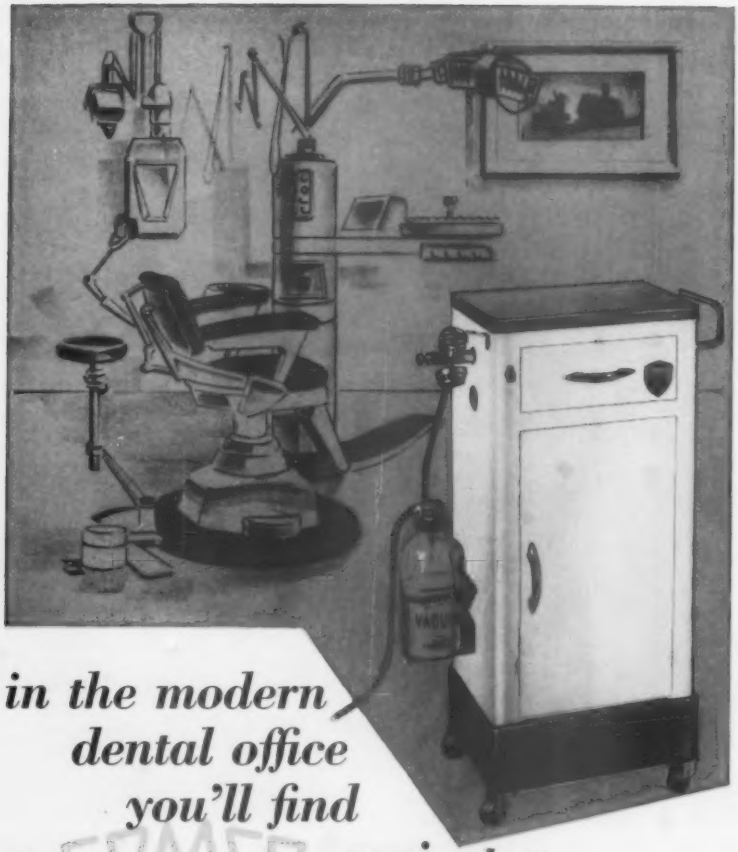


Most denture material may be easily cleaned with a proper brush and Sodium Bicarbonate. This mildly alkaline, gentle abrasive removes stains and organic material without compromising precisely molded surfaces.[1] 1. Accepted Dental Remedies, 26th ed., American Dental Association, 1961, p. 180.

Accepted
COUNCIL ON DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

Arm & Hammer Baking Soda is accepted by the American Dental Association as Sodium Bicarbonate U.S.P. It may be prescribed with confidence wherever Bicarbonate of Soda is indicated.

CHURCH & DWIGHT CO., INC., 70 PINE STREET, NEW YORK 5, N. Y.



in the modern dental office you'll find a GOMCO aspirator

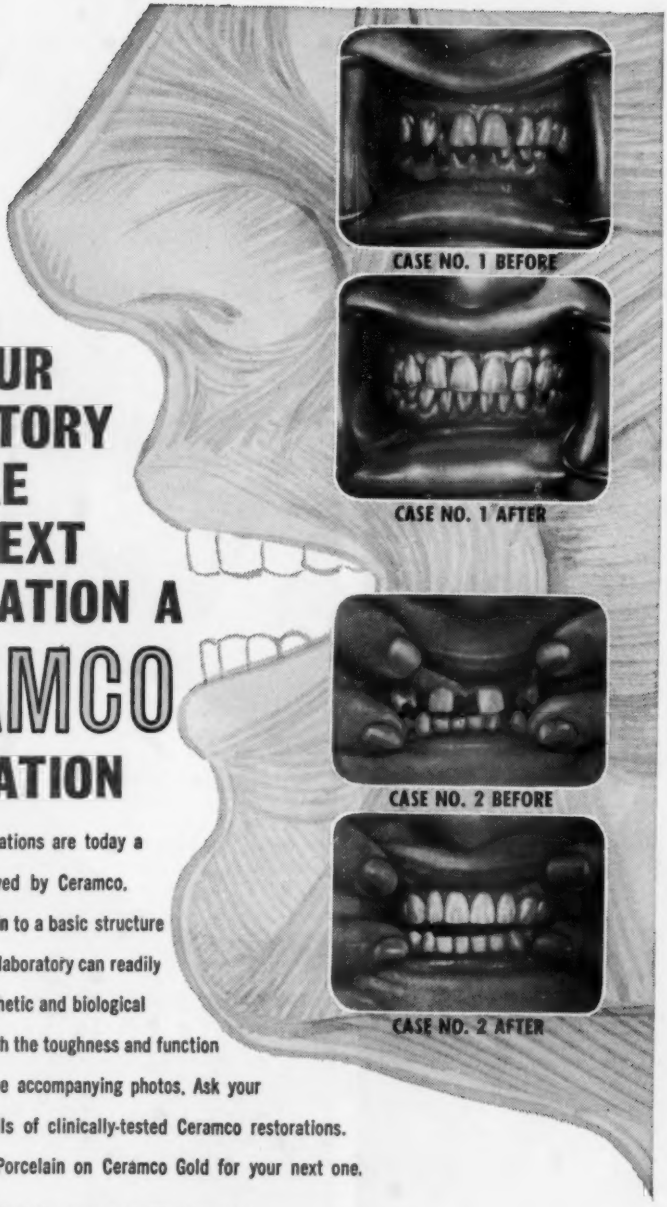
A Gomco No. 796 Cabinet Aspirator will speed up your operations . . . make them easier on you and the patient. Its powerful suction assures a *clean* operating field, resulting in greatly improved visibility. Remember, faster operations conserve chair time . . . can enlarge your practice. And don't forget the prestige this modern, clean-lined unit will add to your office. Compact, it requires less than a square foot of floor space. Thousands of successful dentists rely on the No. 796 for the utmost efficiency and dependability.

For a demonstration, phone your Gomco dealer today!

GOMCO SURGICAL MANUFACTURING CORP.

824-D E. Ferry Street, Buffalo 11, N.Y.

Distributed Outside the U.S.A. and Canada by:
INTERNATIONAL GENERAL ELECTRIC COMPANY
150 East 42nd Street, New York 17, N.Y.



CASE NO. 1 BEFORE

CASE NO. 1 AFTER

CASE NO. 2 BEFORE

CASE NO. 2 AFTER

ASK YOUR LABORATORY TO MAKE YOUR NEXT RESTORATION A CERAMCO RESTORATION

Porcelain-on-gold restorations are today a practical reality—achieved by Ceramco. Fusing **Ceramco Porcelain** to a basic structure of **Ceramco Gold***, your laboratory can readily combine for you the esthetic and biological benefits of porcelain with the toughness and function of gold as shown in the accompanying photos. Ask your laboratory for full details of clinically-tested Ceramco restorations. Then specify Ceramco Porcelain on Ceramco Gold for your next one.

CERAMCO, INC., 34-35 56th St., Woodside 77, New York

CERAMCO

*Ceramco Gold is manufactured solely by Julius Aderer, Inc. and J. F. Jelenko & Co., Inc.

PICK OF THE CROP

DENTAL
COTTON ROLLS

DENTAL DIVISION
Johnson & Johnson

TWO chapters in the story

. . . ENRICHMENT

"The Quiet Miracle"

There are many chapters in the story of cereal food enrichment . . . and many still to be written. But the most important thus far is the "Quiet Miracle"—better health for all America—through better nutrition for all.

Just 20 years ago, millers and bakers began enriching their products with specified amounts of the three B-vitamins—thiamine, niacin and riboflavin—and with the mineral, food iron. Since that time, three nutritional-deficiency diseases related to lack of those vitamins—beriberi, pellagra and ariboflavinosis—have almost disappeared. Incidence of iron deficiency anemia has been reduced.

The "Quiet Miracle" may be assessed in terms of illness never experienced . . . in types of disease physicians no longer see.

If you are skeptical—you might consider another chapter*—studies of chronic alcoholics in the "skid-row" section of Chicago, whose diet consists mainly of liquor and bread. Before enrichment, these men were notoriously subject to nutritional deficiencies. After enrichment, symptoms of vitamin deficiency were difficult to find. Bread was their only source of vitamins. Enrichment the only change.

Thus two chapters in the "Quiet Miracle"—symbolized here by the shining face of a healthy child and the picture of a "skid-row" bum. For additional chapters, fill out the coupon below.

*"Lack of Avitaminosis Among Chronic Alcoholics," U.S. Army Medical Nutrition Laboratory.

ENRICHED...
and whole wheat flour foods are listed among the "Essential Four" food groups set up by the U.S. Dept. of Agriculture's Institute of Home Economics. Diet selected from these foods provides ample protein, vitamins and minerals.

WHEAT FLOUR INSTITUTE
working for a healthier America through nutrition

FREE—USE COUPON OR SEND R_x BLANK

To: Wheat Flour Institute Dept. ADLA-6
309 West Jackson Blvd., Chicago 6

Please send me for professional review copies of the National Research Council pamphlet, "Cereal Enrichment in Perspective," and "The two minute story of THE QUIET MIRACLE," for possible professional distribution in quantities. (Please print)

NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

(Distribution limited to U.S. and possessions)

the perfect team * for finishing and polishing amalgams and gold inlays . . .

* NEW — DEDECO GREEN "INTER-PROX" WHEELS

1 "Inter-Prox" does the work of 100 sandpaper discs!

- So flexible it will almost wrap around a tooth — yet will not fray or tear!
- Need access to very tight interproximal areas? Run your "Inter-Prox" against any abrasive wheel or disc to get a razor edge.
- Save time — get faster finishing and a beautiful polish — all with one wheel.
- Will not scratch or mar tooth enamel — can be cold sterilized.

ONLY $3.00 per package of 25

* for occlusal surfaces — DEDECO GREEN "MIDGETS"

for pinpoint, anatomical finishing and polishing

Will not undercut or destroy margins — will not cut tooth enamel! **$3.45 per dozen**

Write for details about Tan "Inter-Prox" Wheels and Tan "Midgets" for silicates, etc.

DEDECO Manufactured in U.S.A. by Dental Development & Mfg. Corp. 649-653 Washington Ave., Bklyn 38, N. Y.

ELECTRO-MALLET

The electronic foil condenser

Operates on the new principle of high frequency malleting at reduced intensity without sacrifice of foil density. Recognized as superior by leading dental schools and nationally known foil operators.

The **Electro-Mallet** is equally advantageous for condensing **amalgam.**

A 30-day trial without obligation to purchase is available to foil operators. Please write for details.

McShirley Products 6535 San Fernando Glendale 1, Calif.

FOR PARALLAX-FREE DENTAL PHOTOGRAPHY

AUTOMATIC

AUTOMATIC EXAKTA VX-IIa

35-MM. SINGLE LENS REFLEX CAMERA WITH f/2.0 AUTOMATIC ZEISS BIOTAR LENS

For easily made dental photographs and faithfully reproduced oral conditions—facilitating case recording in oral pathology, surgery, orthodontics and full mouth rehabilitation . . . an invaluable aid in patient education. New AUTOMATIC Lens, when fully stopped down, permits focusing and viewing without annoying the patient with modeling lights. In addition, you can use the Exakta for personal photography, sports, portraits, copywork, etc. Priced from $279.50.

FREE! — Write Dept. 206 for Free Descriptive Booklet "B" on Camera & Accessories and Brochure on Close-Up Technique with Automatic Exakta VX-IIa.

EXAKTA CAMERA COMPANY

705 Bronx River Road, Bronxville, New York

just 4 drops (concentrated)

add your own water (economical) for one-fourth glass of mouth wash

refreshing flavor—deodorizing —cleansing—mildly astringent

Astring-O-Sol® Mouth Wash

American Ferment Division, Breon Laboratories Inc., N. Y. 18, N. Y.

Quality with Economy

Clinically proved oral penicillin therapy that costs your patients less

Rx

PENTIDS

Squibb Penicillin G Potassium

Available in these convenient dosage forms: Pentids '400' Tablets (400,000 u.) • Pentids Tablets (200,000 u.) • Pentids Capsules (200,000 u.)

For full information, see your Squibb Product Reference or Product Brief.

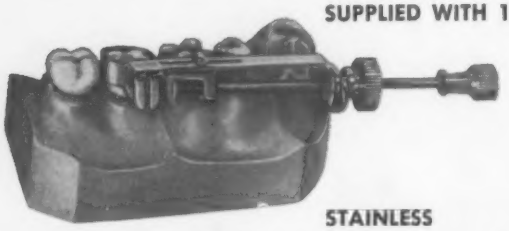
SQUIBB

Squibb Quality — the Priceless Ingredient

"PENTIDS"® IS A SQUIBB TRADEMARK.

IVORY MATRIX RETAINER No. 8N

SUPPLIED WITH 1 DOZEN BANDS



STAINLESS

Applicable for large or compound cavities, designed to simplify the release of the band. It can be used from the buccal or lingual, upper or lower sides of the mouth.

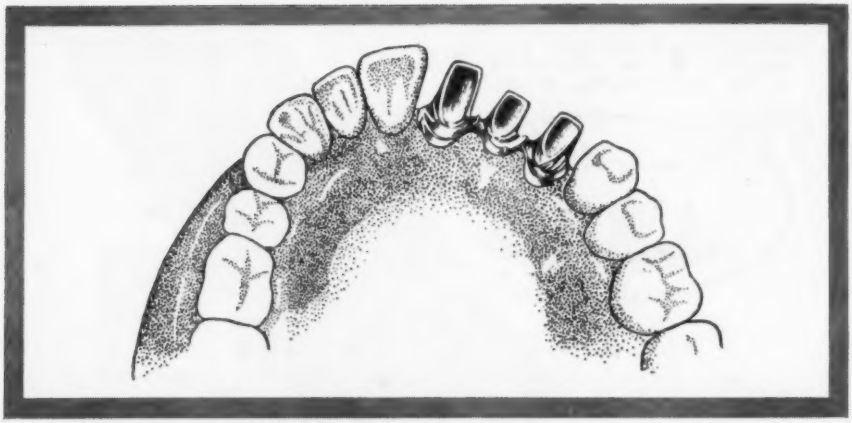
The specially designed bands curve slightly, giving a smaller circumference to the edge toward the gum.

Continuous perfect control of the band can be maintained by operating the inside nut. The end nut allows easy release of the retainer.

J. W. IVORY, INC.

Manufacturer

PHILADELPHIA 2, PA., U.S.A.



THE COPING BRIDGE

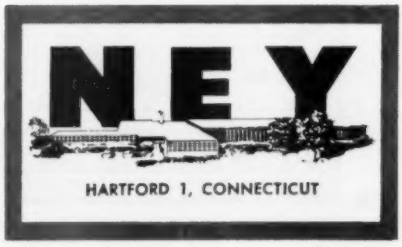
In the coping bridge the abutment teeth on each side of the edentulous area are prepared for the precious metal copings, and cores are cast for the pontics.

When porcelain jacket crowns are to be used, dies are made and the jacket crowns are made on these dies and then transferred to the metal framework. The jacket crowns are then cemented over the copings and the cores. A great advantage here is the fact that the dies can be used later if any one of the jacket crowns should break. Ney-Oro B-2 is an ideal gold to use for the precious metal framework in the above type of case.

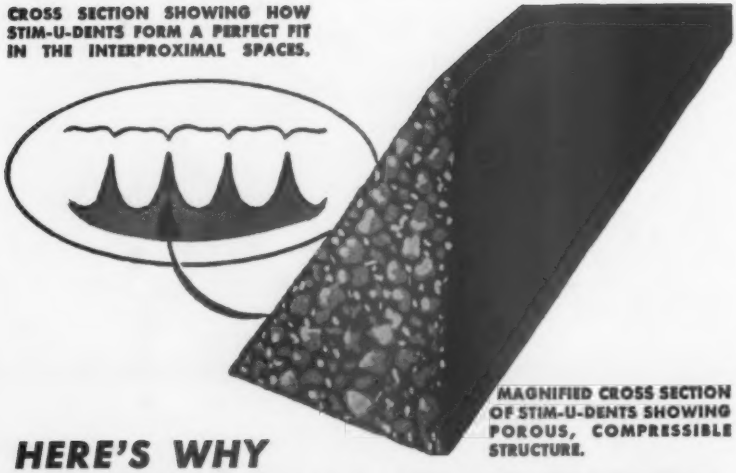
If, on the other hand, it is desired to fire porcelain directly to the metal, Ney-Oro P-16, special porcelain casting gold, would be used for the metal framework of this bridge because it is specifically formulated to operate ideally for direct-to-gold porcelain firing.

This direct fired type of porcelain coping bridge has a distinct advantage in that it can be made in less time than it would take to construct a case with an equal number of individual porcelain jacket crowns. Here too, as in the case of a bridge employing jacket crowns, repair is very practical. While the porcelain is bonded to the gold, it can chip just as it could in a crown. In this case, the core or coping is re-prepared and a porcelain jacket crown is made to fit.

More and more of these restorations are being used today because of the inherent strength of this type of bridge with its precious metal framework and the improved esthetics made possible by the superior porcelain technics now available. *The J. M. Ney Company, Hartford 1, Connecticut.*



CROSS SECTION SHOWING HOW STIM-U-DENTS FORM A PERFECT FIT IN THE INTERPROXIMAL SPACES.



MAGNIFIED CROSS SECTION OF STIM-U-DENTS SHOWING POROUS, COMPRESSIBLE STRUCTURE.

HERE'S WHY

STIM-U-DENTS

ARE SO EFFECTIVE

BECAUSE, WHEN MOISTENED, STIM-U-DENTS, BY REASON OF THEIR COMPRESSIBILITY, form a perfect fit in the teeth spaces not reached by the toothbrush.

When GENTLY MOVED BACK AND FORTH they produce a highly efficient action to the interproximal surfaces, thereby promoting cleanliness and interdental hygiene.

SIMULTANEOUSLY, the contacted teeth surfaces are cleaned and polished, food particles that cause **BAD BREATH** and lead to **DECAY** are removed, and cervical borders of fillings and crowns are rendered bright and clean and far less likely to recurrence of decay.

STIM-U-DENTS are a valuable adjunct in the treatment of periodontal disease.

Ask For FREE SAMPLES for Patient Distribution.

Stim-U-Dents, Inc., 14035 Woodrow Wilson, Detroit 38, Mich.

☐ Send Free Samples for patient distribution.

JADA 6-61

Dr._____

Please enclose your Professional Card or Letterhead

Address_____

City_____ Zone_____ State_____

STIM-U-DENTS

FINISH WHAT THE TOOTHBRUSH LEAVES UNDONE

Acclaimed . . . . . the ideal

HIGH SPEED HANDPIECE

for

CROWN • BRIDGE • JACKET

PREPARATION

Turbo-Jet

WITH ENGINEERED TORQUE

* U. S. Pat. Nos. 2,799,934; 2,871,562; 2,895,738

PROVIDES THE USE OF EVERY

DISC • WHEEL • CYLINDER • CARBIDE

normally used in restorative dentistry and with greater efficiency.

With TURBO-JET's new Speed Control allowing optimum speeds of up to 50,000 rpm, a noticeably greater tactile control is achieved over the entire range of instruments. This added versatility also permits the safe use of large wheels and discs at reduced speed. More work can be accomplished at one sitting because of greater patient comfort and lessening of the dentist's fatigue. Allow yourself to test the feeling of "complete confidence" already familiar to the dentist who owns and operates a TURBO-JET.

ENJOY THESE AND MANY OTHER VALUED FEATURES

LOW NOISE FACTOR . . . . operates more quietly than your present handpiece

VIBRATION FREE . . . . this exceptional design feature introduces your patients to the surprisingly gentle experience of TURBO-JET's tranquil action eliminating apprehension from future visits.

BUILT IN SPRAY . . . . water can be directed with pinpoint accuracy to the tip of the smallest cylinder or the edge of the widest disc.

NEW FLEXIBLE UPRIGHT . . . . full 360° rotation . . . . is adjustable to any angle.

PORTABLE . . . . no plumbing or air connections necessary. Easily moved from one operatory to another.

YOUR OPERATORY EQUIPMENT IS NOT COMPLETE UNTIL YOU HAVE A TURBO-JET. NO OTHER HIGH SPEED INSTRUMENT COMBINES VERSATILITY AND COMFORT TO SUCH A HIGH DEGREE.

Fill in and mail the attached coupon today for your free literature "The Inside Story of High Speed."

BOWEN & COMPANY, Inc.

P. O. Box 5818, Bethesda 14, Md.

Please send me without obligation your FREE Booklet.

Dr. _____

Address _____

City _____ Zone _____ State _____

Reliable
PROFESSIONAL LIABILITY
INDIVIDUAL INSURANCE
with proficient defense
that cuts the cost

THE
MEDICAL PROTECTIVE COMPANY
FORT WAYNE, INDIANA

Professional Protection Exclusively since 1899

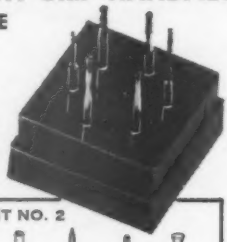
Operating in: California, Florida, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Pennsylvania, Texas, and Wisconsin.

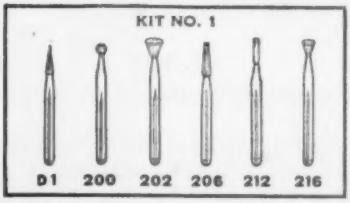
NEW! INDIAN HEAD HIGH SPEED DIAMOND POINTS
with patented SLOT-IN-SHANK for FRICTION GRIP HANDPIECES
also available in LATCH TYPE

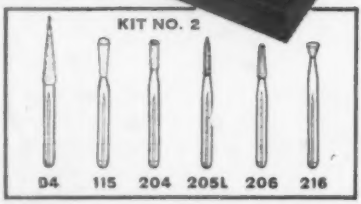
- Guaranteed not to peel.
- SLOT-IN-SHANK eliminates slipping of diamond points in friction grip handpiece.

SPECIAL INTRODUCTORY OFFER . . . 6 DIAMOND POINT KIT

KIT No. 1 $8.50 — **KIT No. 2** $10.50 — **KIT No. 3—SPECIAL FINISHING SET** (Same size as Kit No. 2) $12.50)







NEW! UNION BROACH
AIR-TURBINE MAINTENANCE KIT
for BORDEN AIROTOR
NOW . . . DO IT YOURSELF . . .
Save $85.00 or more per year!

PRICES:
The Air Turbine Maintenance Kit consists of:
Set of Tools and 3 Sets of 2 Bearings.....$60.00
After initial expense for tool the changeover refills of bearings are:
Package of 3 Sets of 2 Bearings.....$36.00
Package of 1 Set of 2 Bearings.....$15.00
Descriptive Literature sent upon request.

UNION BROACH CO., INC. 80-02 51st AVENUE, ELMHURST 73, N. Y.

for
dental
pain

**of trauma, infection,
dental or surgical procedures**

Zactirin®

Ethoheptazine Citrate (75 mg.) with Acetylsalicylic Acid (325 mg.), Wyeth

analgesia PLUS anti-inflammatory benefits

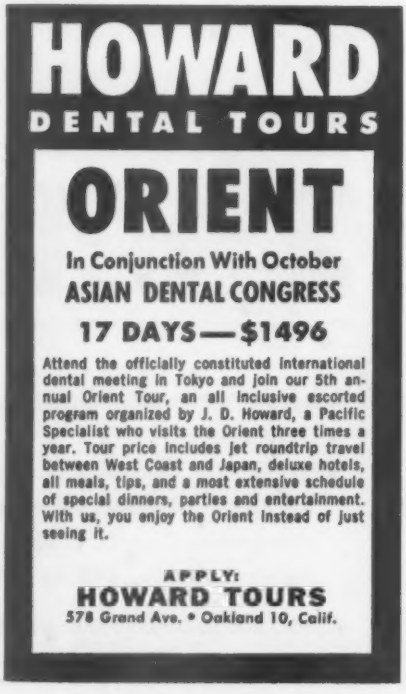
- relieves pain
- non-narcotic, nonaddicting, well tolerated
- Two ZACTIRIN tablets are equivalent in analgesic effectiveness to codeine, 32 mg. (½ gr.) plus acetylsalicylic acid, 650 mg. (10 gr.).

Wyeth Laboratories Philadelphia 1, Pa.

Wyeth
SERVICE TO DENTISTRY

WITHSTANDS
HEAVY IMPACT
S. S. WHITE NO. 13
GOLD
For hard, type C inlays
Dark coin Gold color. Finishes beautifully. Stands up to severe stress. Use it for hard inlays, thin ¾ crowns, incisal angles over-facings, slice preparations, pontics and anterior bridge abutments.
THE S. S. WHITE DENTAL MFG. CO.
Philadelphia 5, Pa.

"Super Absorbent"
COTTON ROLLS
These improved cotton rolls are a delight to the efficient dentist and are not harsh to the patient's mouth. They are actually spun from 100% pure surgical absorbent cotton to make them softer, more pliant and noncollapsible. They adapt easily into any position, are stretchable and small tufts are quickly detachable.
DENTAL ABSORBENTS CO.
619 East Montecito St.
Santa Barbara, Calif.
FREE SAMPLE
Use Coupon
Gentlemen:
Please send me a free, generous sample of DENTAL ABSORBENTS.
DR.
STREET
CITY and STATE


HOWARD
DENTAL TOURS
ORIENT
In Conjunction With October
ASIAN DENTAL CONGRESS
17 DAYS—$1496
Attend the officially constituted international dental meeting in Tokyo and join our 5th annual Orient Tour, an all inclusive escorted program organized by J. D. Howard, a Pacific Specialist who visits the Orient three times a year. Tour price includes jet roundtrip travel between West Coast and Japan, deluxe hotels, all meals, tips, and a most extensive schedule of special dinners, parties and entertainment. With us, you enjoy the Orient instead of just seeing it.
APPLY:
HOWARD TOURS
578 Grand Ave. • Oakland 10, Calif.

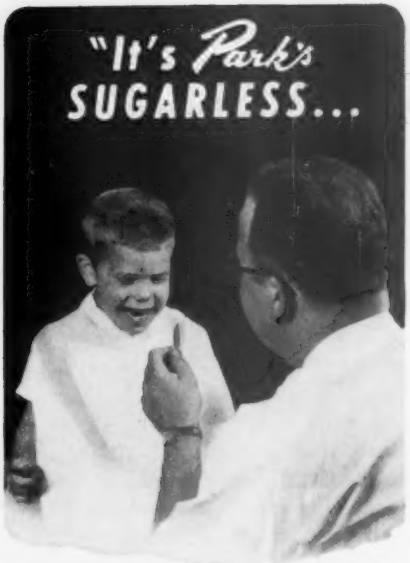
UNIVAC®
Polychrome

BLENDABILITY . . . It is not unusual to find as many as four different shades of teeth in the same mouth. The blendability of these variations of color illustrate nature's artistry and esthetics. Blendability is also an inherent, exclusive feature of the Polychrome and UNIVAC color systems. The variations in color, normal markings and stains found in natural teeth are meticulously reproduced . . . they blend with each other and with vital teeth, allowing full freedom to reproduce nature's color variations and characterizations in the denture.

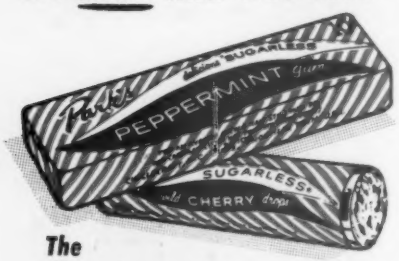
BLENDABILITY is but one of many singular qualities inherent in UNIVAC Polychrome . . . the only anteriors providing every medium by which your abilities can be employed *without restriction* toward the creation of "living" full and partial dentures, avoiding that "DENTURE LOOK"... psychologically comforting and stimulating to your denture patients.

Write for booklet . . . Polychrome Colors in UNIVAC Porcelain.

UNIVERSAL DENTAL COMPANY
48th at BROWN STREET, PHILADELPHIA 39, PA.



The TREAT After Treatment!"

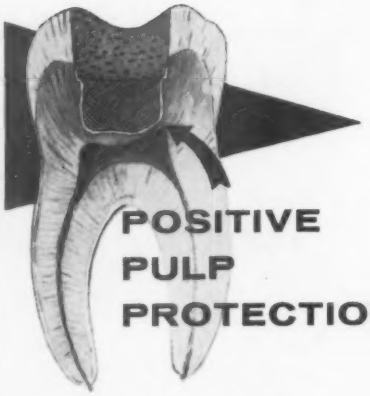


The *Preferred*
Non-Cariogenic Gum and Mints

Treat patients of all ages to non-cariogenic PARK'S Sugarless Gum. Recommend continued use . . . PARK'S does not promote decay! Made from Sorbitol and Mannitol in 8 popular flavors. Another treat is PARK'S Sugarless Mints in 7 flavors. Start patient education for restricted sugar intake right in your office . . . treat them to PARK'S Sugarless Gum and Mints!

Send for FREE Samples and Literature Today

Park's SUGARLESS
CHEWING GUM • MINTS
CHICLECRAFT, INC., KNOXVILLE, TENNESSEE
Makers of Fine Chewing Gum Since 1885



POSITIVE PULP PROTECTION

Pulpdent ROWER

LIQUID

BRAND OF CALCIUM HYDROXIDE - METHYLCELLULOSE SUSPENSION

CAVITY LINER

PROTECTS PULP 3 WAYS

1 **NEUTRALIZES** cement acids
2 **MINIMIZES** thermal shock
3 **STIMULATES** formation of secondary dentin

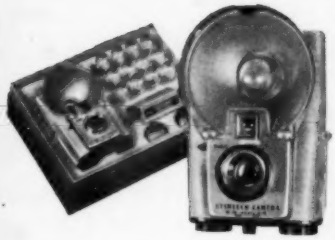
BE SECURE . . . rely only on PULPDENT (Rower) LIQUID, the original, premixed calcium hydroxide cavity liner. Clinically proven, safe, effective. Available at recognized dental dealers.

For further information, write to:

ROWER DENTAL MFG. CORP.
Boston 16, Mass., U.S.A.

FOR THE DENTIST—who wants sharp, clear pictures—color or black-and-white

Made in full color with Kodak Startech Camera.
Full face—at 10- to 16-inch range;
view of teeth—at 4- to 8-inch distance.



. . . the Kodak Startech Camera Outfit

Here's a camera outfit that you can put into use right away. Even if you don't know a thing about photography! Just follow instructions . . . slip on a supplementary lens . . . set a distance pointer . . . sight the picture . . . and shoot. The flash takes care of the exposure; the small lens opening assures sharpness in depth.

Outfit consists of Kodak Startech Camera, color film, flash lamps, batteries, two supplementary lenses and a background easel. Price, less than $35.

Write for further particulars.

Price is subject to change without notice.

EASTMAN KODAK COMPANY
***X-ray Sales Division,* Rochester 4, N.Y.**

Kodak
TRADE MARK

THE BOOK YOU'LL NEED THIS YEAR

1961 Accepted Dental Remedies

For over 25 years, *Accepted Dental Remedies* has been "the last word" in dental therapeutics in thousands of dental offices. This year more than ever, ADR belongs within easy reach on your desk for it contains a wealth of important material to help you render a better dental service as well as conserve time and money in your practice.

Fluorides. Completely revised for '61, ADR contains an expanded new chapter on stannous fluoride dentifrices, topical applications and other aspects of this important subject.

New Drugs. ADR includes information on three new local anesthetics, plus revised and updated chapters on such helpful subjects as the handling of office emergencies, dental treatment of patients receiving medical care, writing prescriptions.

List of accepted brands. As usual, ADR for '61 contains a current listing of accepted drugs that have met the exacting standards of the ADA Council on Dental Therapeutics.

Order your 1961 *Accepted Dental Remedies* today. Only $3 per copy.

American Dental Association
Order Department
222 East Superior Street
Chicago 11, Illinois

Please send me ___ copies of the 1961 *Accepted Dental Remedies* at $3 per copy. My remittance is enclosed.

Name_____

Address_____

City_____ Zone____ State_____

656

Why so many dentists have joined the

A.D.A. PLAN

The A.D.A. Group Life Plan underwritten by Great-West Life, is individually tailored to your needs . . . protecting your family during those vital years of peak responsibility — growing family, growing practice. The Plan provides $20,000 basic life insurance up to age 60 ($30,000 in the event of accidental death), with benefits adjusted to your reducing needs of later years. New premium rates are lower than ever (see table). And a new clause has been added waiving premium payments in case of permanent disability prior to age 60.

The new low yearly premiums are:

- $40 to age 30
- $80 from age 31 to 40
- $160 from age 41 to 50
- $260 from age 51 to 60
- $300 for reducing amounts beyond age 60

Write today for complete information to:

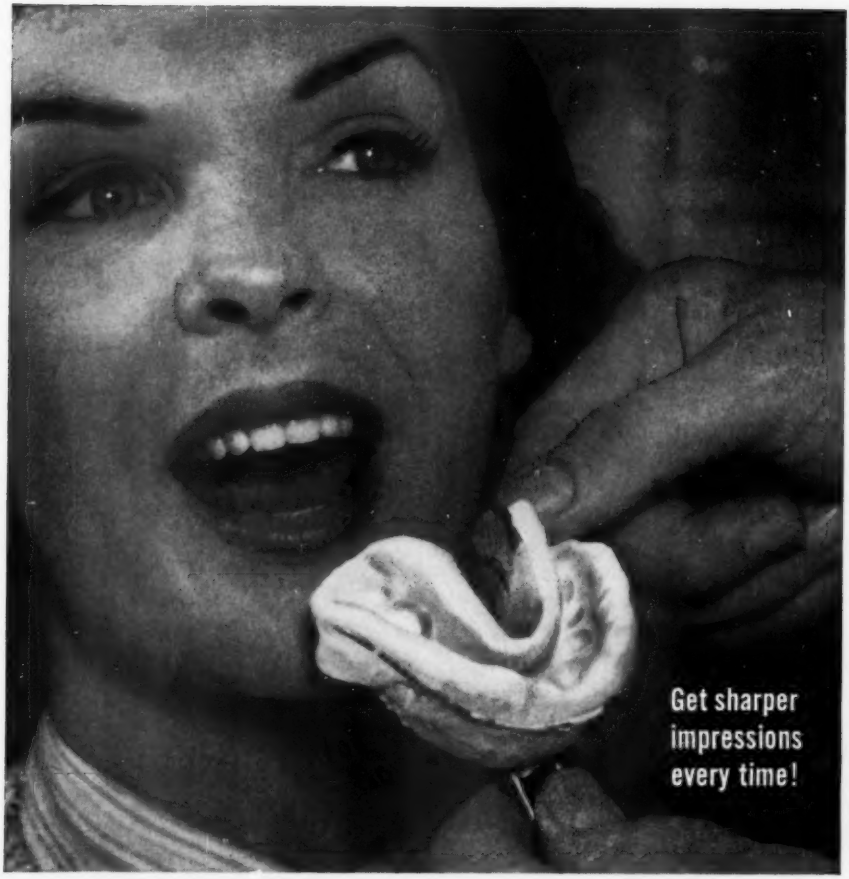
A.D.A. GROUP LIFE PROGRAM
The Great-West Life Assurance Company
1035 Field Building
135 S. LaSalle Street, Chicago 3, Ill.

THE
Great-West Life
ASSURANCE COMPANY
HEAD OFFICE, WINNIPEG, CANADA

YOUR FUTURE IS OUR BUSINESS TODAY

PUMICE AND MEDICINE CUP
Most useful receptacle when cleaning teeth or for medical treatments. Renders a close range to the mouth, avoiding spilling of preparation. Made of rustless, acid-proof metal.
TWO HANDY DENTAL AIDS
No. 6 SHARPENING STONE
A new stone specifically designed for sharpening U-15 and Gracey Scalers. A simple push and pull motion will put a new edge on your instruments.
Care must be taken while sharpening these delicate scalers to keep the angle of the edges the same as was originally designed.
One Stone—
Two Sharpening Points
GRACEY
U-15
H. F. FRIEDY MFG. CO. INC
3118 N. Rockwell St., Chicago 18, Illinois

BAKER GOLD FOIL BAKER
IN SHEETS OR CYLINDERS
BAKER
Gold Foil
BAKER & CO., INC.
"There is no finer Gold Foil than Baker Foil." It is supplied in 4 inch square sheets, cohesive or non-cohesive, in 1/10 ounce books, and prepared Cylinders in 1/10th oz. or 1/40th oz. sealed glass vials. Cylinders may be ordered in sizes ¼, ½, ¾ and 1. 1/10th oz. and 1/40th oz. vials of assorted sizes are also available.
Specify Baker Foil—
you will be pleased!
BAKER
ENGELHARD INDUSTRIES, INC.
BAKER DENTAL DIVISION
850 PASSAIC AVENUE • EAST NEWARK, NEW JERSEY
NEW YORK CHICAGO LOS ANGELES SAN FRANCISCO



LAVORIS MOUTHWASH HELPS YOU WORK 3 important ways...

- **"Cuts" Mucus Film.** A rinse with full-strength Lavoris before an impression helps clear away mucus, prevents air bubbles. Many dentists now use Lavoris this way routinely.
- **Keeps Operative Area Cleaner.** Lavoris' unique cleansing action effectively and thoroughly cleans away mucus, food particles and impurities. Use Lavoris Spray ½ strength or stronger. (Wouldn't you rather work in a Lavoris-clean mouth?)
- **Helps Promote Patient Comfort.** To nervous patients, even minor discomforts loom large. The pleasant taste and feel of Lavoris refreshes, helps keep them at ease. The bright red color of Lavoris helps mask minor hemorrhage.

LAVORIS

CLEANSING • REFRESHING

used by more dentists than any other mouthwash!

PROFESSIONAL GAL. SIZE, ONLY $2.50.

Send check to LAVORIS DIVISION, Vick Chemical Co. Box 990, Wilmington 99, Del.

Samples for office and patient use available on request.

scan (skan), v. t.; to go over and examine point by point; to examine with care; to look closely at or into; scrutinize. . . .
—*Webster's New International Dictionary, 2nd Edition*

It takes 200 hours of reading time each month to select the articles for a single issue of DENTAL ABSTRACTS. Over 400 periodicals from 50 nations are *scanned* to extract for you the cream—the concentrated extract—of current thought, research, and clinical experience in dentistry.

DENTAL ABSTRACTS is different from other dental journals. Its editorial staff scans the professional literature, not only of dentistry, but all allied sciences as well to present in concise, abstracted form what is new and important *to the practicing dentist.*

What does this mean to you as a practitioner? Simply that DENTAL ABSTRACTS can now keep you up-to-date on the latest technics, drugs and instruments—with only the barest expenditure of reading time each month. Each department of DENTAL ABSTRACTS gives you important, basic information—material that will help you provide better dental service to your patients as well as save you time and money.

Is it worth $8 a year to you ($9 outside the U.S.) to keep abreast of current knowledge in your profession? Thousands of your fellow practitioners in countries around the world have found DENTAL ABSTRACTS the easy, effective way of solving the old problem of "keeping up with the literature."

Why not try it for yourself? You can order below.

Subscription Department, American Dental Association
222 East Superior Street, Chicago 11, Illinois

Please enter my subscription to DENTAL ABSTRACTS for 1 year ($8, U.S.; $9 overseas). My remittance is enclosed.

Name_____

Address_____

City_____ Zone_____ State_____

658

New! MICROMETRIC SYSTEM of

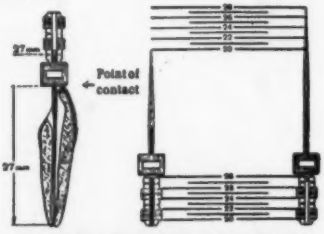
STAINLESS STEEL COLOR CODED UNIGAUGE

ROOT CANAL TEST INSTRUMENTS

Our Micrometric System assures the Endodontists that all our Absorbent Points, Gutta Percha Points, Silver Points, Files, Reamers, Pluggers, etc., are uniform in size and taper. Due to development of Stainless Steel #361, we are able to manufacture new and sharper instruments.

THE TEST HANDLE

. . . is a small and adjustable stopper with a built-in scale. It can be adjusted with ease and rapidity to the exact length required for test reamers and files.



SPECIAL INTRODUCTORY OFFER!

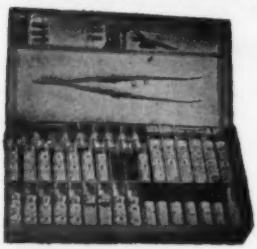
TEST KIT No. 1 Unigauge (Files Only): Containing 3 of each size plus 6 Handles (Sizes 1-6).....**$10.00**

TEST KIT No. 1A Unigauge (Reamers Only): Containing 3 of each size plus 6 Handles (Sizes 1-6).**$10.00**

SPECIAL! STAINLESS STEEL

UNIGAUGE KIT No. 4H COLOR CODED

TEST INSTRUMENTS and HANDLES



CONTAINING:
- 460 Guttapercha Points
- 410 Absorbent Paper Points
- 60 Silver Points
- 3 Test Files of each Size 1, 2, 3, 4, 5, 6
- 1 Test Handle of each Size 1, 2, 3, 4, 5, 6
- 1 Set Test Wrenches
- 1 Pkg. Files Styles B, Asst. 7-12
- 1 Endodontic Plier
- 1 Aluminum Root Canal Cabinet

VALUE $46.00

NOW ONLY $35.00

WRITE FOR OUR NEW 74 PAGE CATALOG

UNION BROACH CO., INC
80-02 51st Avenue Elmhurst 73, N.Y.

100 PERCENT PERFECT RUBBER IMPRESSION TECHNIC. With this new RUBBER impression technic

- no syringe is needed.
- no custom tray used.
- no injured gum tissue.
- no pain to patient.
- no mistakes.
- no medical or surgical tissue retraction.
- no double rubber mix at one time.
- a saving of 60 to 80 minutes.
- perfect impression each time.
- rubber does all above things.

REQUEST NEW TECHNIC

FREE—FREE—FREE—FREE—

NOT EVEN A POSTAGE STAMP

USE THIS LABEL TO REQUEST LITERATURE AND TO SHIP IMPRESSIONS OR HARD STONE MODELS FOR ALL TYPES OF JACKETS, GOLD INLAYS AND BRIDGES. NO POSTAGE, NO MONEY, NO C.O.D.

FROM DR._____

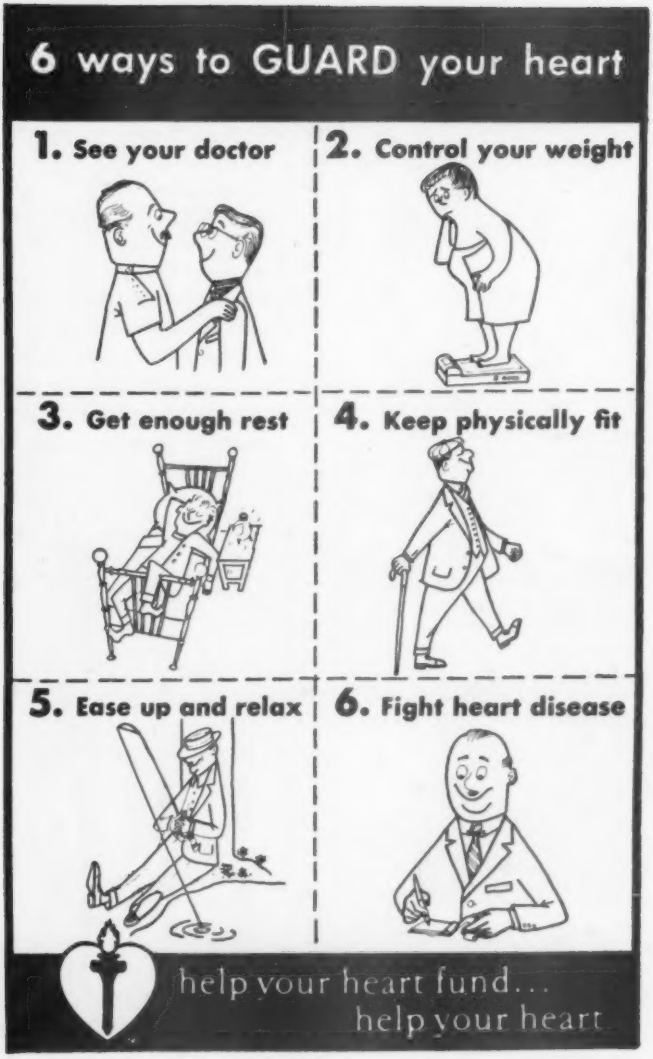
FIRST CLASS PERMIT NO. 50786 CHICAGO, ILL.

BUSINESS REPLY LABEL
No Postage Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY —

M. W. SCHNEIDER Dental Laboratory
27 East Monroe Street
CHICAGO 3, ILLINOIS

A661


6 ways to GUARD your heart
1. See your doctor
2. Control your weight
3. Get enough rest
4. Keep physically fit
5. Ease up and relax
6. Fight heart disease
help your heart fund...
help your heart

COMPARE — and you too will choose the auxiliary engine with the big PLUS values

⊕ Bigger, stronger motor—a full 1/6 or 1/8 HP for maximum torque at all speeds

⊕ Speeds to 12,000 or 45,000 RPM, depending on model

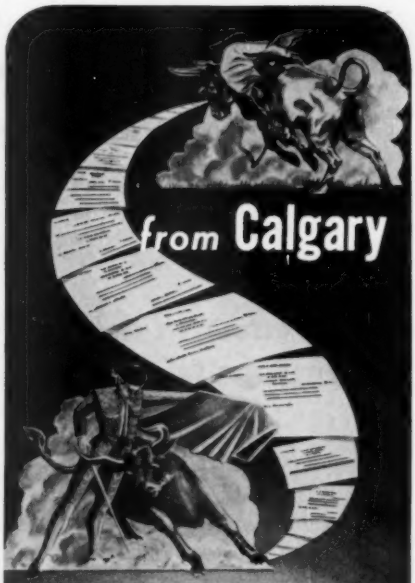
⊕ Arm has offset pulleys and individual axles for smoother, quieter operation and longer belt life

⊕ Engine inspection ports let you do the simple maintenance that avoids costly repairs

⊕ Wide choice of models—bench, wall, floor, Unette type or unit mounted

Ask your dealer or write for literature

EMESCO DENTAL CO.
150 Fifth Ave., New York 11, N.Y.



to Madrid

HISTACOUNT®
PRODUCTS

Billheads and Statements, for instance. The billheads and statements we printed last year, placed end to end, would reach from Calgary, Alberta, Canada to Madrid, Spain.*

This fact is important because it reflects your faith in us . . . your satisfaction in our fine Histacount products.

If, perhaps, you haven't yet tried Histacount products, you should. You will be pleased with the fine quality, low prices, courteous service and unconditional guarantee.

*4100 miles

PROFESSIONAL printing company, inc.
HISTACOUNT BUILDING
NEW HYDE PARK, N. Y.

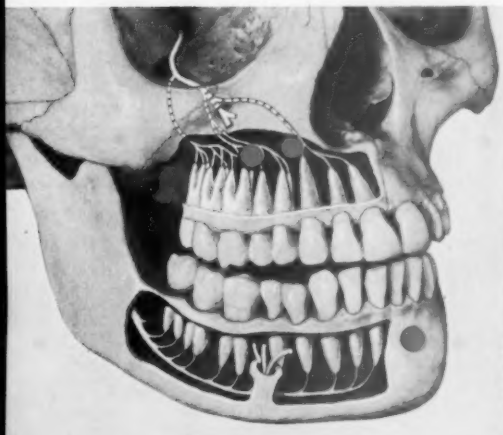
America's Largest Printers to the Professions

CARBOCAINE® HCl

BRAND OF MEPIVACAINE HCl

for effective patient management...

SELECT THE ANESTHESIA TO SUIT THE PROCEDURE..



CARBOCAINE HCl 2%

with NEO-COBEFRIN® 1:20,000

Brand of levo-nordefrin

FOR LONGER LASTING ANESTHESIA IN

- oral and periodontal surgery
- quadrant dentistry
- pulp canal work

IT'S CARBOCAINE IN ANY CASE...

that's the long and short of it!

COOK-WAITE Laboratories, Inc.

New York 18, N. Y.

PROFESSIONAL LITERATURE AND SAMPLES ON REQUEST.

CARBOCAINE AND NEO-COBEFRIN ARE THE TRADEMARKS (REG. U.S. PAT. OFF.) OF STERLING DRUG INC.

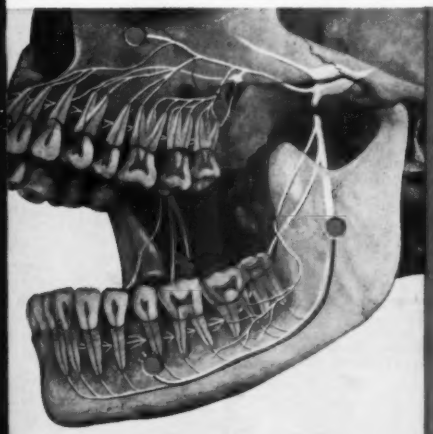
UNIQUE AMONG DENTAL ANESTHETICS.....

consistently produces satisfactory anesthesia [1-5]

WITHOUT THE NEED OF A VASOCONSTRICTOR

New CARBOCAINE 3% **without** vasoconstrictor produces total anesthesia as effectively as CARBOCAINE 2% with Neo-Cobefrin,[6] although of shorter duration. Onset is rapid.[1,3,8] Soft tissue anesthesia is reduced by as much as an hour.[6] In simple extractions, CARBOCAINE 3% avoids the hazard of delayed hemorrhage and helps prevent alveolitis.[7]

SUCCESSFUL PRACTICES NEED BOTH!



CARBOCAINE HCl 3%

without vasoconstrictor

FOR SHORTER ACTING ANESTHESIA IN

- those restorative procedures which high-speed techniques have shortened so dramatically
- simple extractions
- children's dentistry

TWO Anesthetic Solutions that are

TIME CONTROLLED — since **you** select the anesthesia

WELL TOLERATED — with a wide margin of safety

RAPID — so rapid that onset has been called "immediate"

DEEP — and penetrating because they diffuse readily

References: 1. Berling, C. Carbocaine in local anaesthesia in the oral cavity. Odont. Revy. 9:254 1958. 2. Mumford, J. M., and Gray, T. C. Dental trial of Carbocaine. Brit. J. Anaesth. 29:210 May 1957. 3. Feldmann, G., and Nordenram, A. The anaesthetic effect of Carbocaine and lidocaine. Svenska Tandl.-Tidskr. 52:531 1959. 4. Sadove, M., and Wessinger, G. D. Mepivacaine, a potent new local anesthetic. J. Internat. Coll. Surgeons 34:573 Nov. 1960. 5. Lock, F., Vernino, D., and Sadove, M. Mepivacaine HCl (Carbocaine): a preliminary clinical study. J. Oral Surg., Anes. & Hosp. D. Serv. 19:16 Jan. 1961. 6. Weil, C., Welham, F. S., Santangelo, C., and Yackel, R. F. Clinical evaluation of mepivacaine hydrochloride by a new method (to be published). 7. Schwarzkopf, H. A further advance within the field of odontological local anesthesia. Deutsche Zahnärztebl. No. 24 1959. 8. Sadove, M. S. A preliminary report on Carbocaine, a new local anesthetic. New Physician 9:39 Sept. 1960.

Classified advertising

Forms close on 20th of second month preceding month of issue.

Remittance must accompany classified ads.

Classified advertising rates are as follows:

30 words or less—per insertion.....$6.00
Additional words, each.....15
Answers sent c/o A.D.A.....no extra charge

Replies to A.D.A. box number ads should be addressed as follows:

American Dental Association
222 E. Superior Street
Chicago 11, Ill. Box _____

Box number must appear on the envelope.

PRACTICES AND OFFICES FOR SALE AND/OR RENT

ARIZONA—TUCSON. Pediatrician with active practice will provide space to specifications for an orthodontist and a pedodontist. References required. Contact Dr. Charles A. Tompkins, 3926 E. Pima, Tucson, Ariz.

•

CALIFORNIA—Highland Professional Center of Los Angeles has one suite left. Three operatories have northern exposure into a beautiful garden. Suite is air conditioned, has hi fi music and ample parking space. Exceptional opportunity for orthodontist—none in area. Contact Mr. Almskog, 5823 York Blvd., Los Angeles 42, Calif.

•

CALIFORNIA—For sale. Well equipped office and active, well established general practice. Located in nine unit medical building between Hollywood and downtown area. Reasonable rent. Retirement urgent. Address A.D.A. Box No. 341.

•

CALIFORNIA—Merced. For sale. General practice and fully equipped four-chair office. Available immediately. Terms. Address A.D.A. Box No. 342.

•

CALIFORNIA—Southern. For sale. Modern, fully equipped two-chair office and practice. Located in small medical building in fast growing, smog free area. Additional operatories plumbed. Little cash needed. Personal, family reasons force sale. Address A.D.A. Box No. 297.

COLORADO—For sale. Active practice. Modern equipment, two operatories, new building, renewable lease. Excellent opportunity for general practitioner. Beautiful small town near Denver. Selling for health reasons. Address A.D.A. Box No. 298.

•

CONNECTICUT—For sale. Two-chair dental practice. Town of 6,500. Other full time dentist lives elsewhere. Twenty minutes from Hartford. Address A.D.A. Box No. 162.

•

CONNECTICUT—For sale. Three-chair office in city of 30,000. Grossed over $75,000 last year. Ready to retire at age 50. Will sell for $25,000 plus inventory. Any terms desired. Address A.D.A. Box No. 343.

•

CONNECTICUT—For sale. House-office centrally located in prosperous town in Fairfield County. Modern Ritter equipment. Thirty year successful dental location. Retiring. Address A.D.A. Box No. 344.

•

CONNECTICUT—For sale. Modern, newly decorated two-chair dental office building and general practice of deceased dentist. Completely and attractively furnished. Like new equipment. Excellent location. Address A.D.A. Box No. 345.

•

FLORIDA—Orlando. For sale. Modern office, three operatories, private consultation room, new equipment, etc. Selling building, practice and equipment. Make offer. Write P. O. Box 7483, Orlando, Fla.

•

FLORIDA—For sale or lease. Modern medical building suitable for dental offices, 1,250 sq. ft. floor space, large paved parking area. For details contact W. W. Wirt, Brooksville, Fla. Phones 796-2144 or 796-4210.

•

FLORIDA—St. Petersburg Beach. Office space available for dentist in professional building. Pleasant residential area in need of dentist. First three months, rent free. Interested parties please contact Peter J. Palmisano, M.D., 5995 Gulf Blvd., St. Petersburg Beach 6.

•

FLORIDA—Southeast coast area. For rent. New attractive office set up for three-chair operation. Monthly rent $181.33, including air conditioning and utilities. First year's gross over $19,000. Will turn over patients. Leaving area. Address A.D.A. Box No. 377.

A Good Alloy Need Not Be Expensive

1 oz. @ $2.20 per oz.
5 oz. @ $2.10 per oz.
10 oz. @ $2.00 per oz.
20 oz. @ $1.90 per oz.
Orders over 20 oz., F. O. B. Seattle

30 oz. @ $1.80 per oz.
50 oz. @ $1.70 per oz.
100 oz. @ $1.60 per oz.

THIS PRODUCT APPEARS ON THE A. D. A. LIST OF CERTIFIED DENTAL MATERIALS

Speyer's Alloy amalgamates smoothly in minimum time—carves exceptionally well in ten minutes—produces a hard, well-sealed mass—polishes beautifully.

- 68½% silver.
- No initial contraction.
- 6.9 Microns Cm expansion in 24 hours.
- 1.6% flow 24 hours after amalgamation.
- Crushing strength 50,000 lbs. per sq. inch.
- Complete directions with every bottle.

IF YOUR DEALER CAN'T SUPPLY YOU, ORDER DIRECT

SPEYER

MEETS WITH A.D.A. SPECIFICATION #1

SPEYER SMELTING & REFINING CO.
216 Medical & Dental Bldg., Seattle 1, Wash.

Please send_____oz. @ $_____per oz.
Fine_____; Extra Fine_____; Regular_____
I enclose check for $_____
Dr._____
Address_____
City_____State_____

Samples Sent On Request

FLORIDA—Suburban Miami. For sale. Two-chair office. Very modern equipment. Airotor, central air conditioning, etc. Active practice grossing over $35,000 with short hours. Price $6,000 which is half appraised value. Address A.D.A. Box No. 346.

•

GEORGIA—For sale. Owner 73 with long and very profitable practice established since 1913, wishes to retire. Have one of the best equipped dental clinics in the South. In addition to selling practice and equipment, will also sell or lease modern brick building which in addition to office has three four-room apartments, ample parking space. Terms to suit buyer. A very desirable place to live. Located in the healthful Piedmont hills of north Georgia, 60 miles west of Atlanta. Good schools and churches. Small town but has $100,000 weekly payroll. Many workers commute from large surrounding area. One factory making men's clothing which has national distribution, employs 1,200 people. A wonderful opportunity. For further information write Dr. J. G. Morris, Bowdon, Ga.

•

ILLINOIS—For sale. Lucrative general practice established 32 years. Modern, fully equipped two-chair ground floor office. Former owner deceased. Need successor urgently. Address A.D.A. Box No. 347.

•

ILLINOIS—Central. For sale. Well established dental practice in small town with wide drawing area. One operating room, business office, reception room, laboratory, x-ray developing and storage shelves. Former owner deceased. Address A.D.A. Box No. 348.

ILLINOIS—For sale. Large, well balanced general practice in town of 200,000. Leaving on account of health. Wish to sell during spring or summer. Address A.D.A. Box No. 254.

•

IOWA—For sale. New, air conditioned brick office. Equipped with two S. S. White operating rooms, compressor, x-ray, etc. Recall list. High gross. Another dentist badly needed. Owner leaving. Prosperous north Iowa town of 6,000. Very fair price. Country club. Address A.D.A. Box No. 349.

•

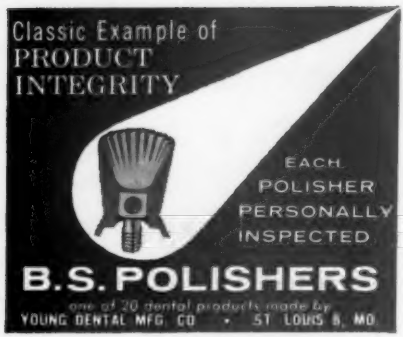
KANSAS—For sale. Two-chair office and practice (some orthodontics) established 35 years. County seat. Population 2,500. Good schools, churches, excellent farming community. Will sell for less than invoice. Address A.D.A. Box No. 216.

•

KANSAS—North central. For sale. Established practice. Fully equipped two-chair office. Across from new medical clinic. Residential area. Annual gross $30,000. Population 3,000. Owner wishes to continue graduate study. Address A.D.A. Box No. 350.

•

MAINE—Rockland. For sale. Modern dental office and general practice of prominent deceased dentist. City of 10,000. County seat. Wonderful opportunity. Write Mrs. Aina Howard, Owls Head, Maine.



MASSACHUSETTS—Cape Cod. For rent. Two-chair office. Two-bedroom apartment available, if desired. Address A.D.A. Box No. 351.

•

MICHIGAN—For rent. Three rooms and lavatory on ground floor. Ideal location. Was occupied by dentist for 10 years. Good schools, growing and prosperous community. Need more dentists. Address Mrs. H. A. Adrounie, 126 S. Broadway, Hastings, Mich.

•

MICHIGAN—Northeast—lower peninsula. For sale. Practice established 30 years. Two-chair completely equipped office. Downtown corner location. Six rooms on second floor. Turbo-jet, laboratory. Growing community. Deposit, balance on contract. Retiring. Address A.D.A. Box No. 352.

•

MICHIGAN—For sale. Dental practice, equipment and centrally air conditioned building. Two operatories. Located on ground floor on main street in small town 70 miles northeast of Grand Rapids. Leaving to specialize. Address A.D.A. Box No. 353.

•

MISSOURI—For sale. Two-chair, fully equipped dental office. Instruments and some supplies. Air conditioned, low overhead, 36 years in same location. Office located in the heart of Overland. Former owner deceased. Address Mrs. Adeline Wilson, 2472 Hartland, Overland 14, Mo. Phone HA 9-1911.

•

MISSOURI—For sale or lease. Equipment of modern dental office and laboratory of deceased dentist. Will consider rental of downtown modern suite to purchaser. Address P.O. Box 166, Washington, Mo.

•

NEW JERSEY—Dental office available, fully air conditioned. South Jersey community, 35 miles from Philadelphia and the same distance from Atlantic City. Ideal location, city of 38,000, dentist needed. Address A.D.A. Box No. 354.

NEW JERSEY—Southern. For sale. Unusual opportunity to purchase active and rapidly growing two-chair office. Ritter H-1 unit, motorchair, dual x-ray, Airotor, etc. First rate supply inventory. Grossed $24,000 in third year. Purchase price is value of equipment, supplies and some improvements. Modest rent. Leaving for personal reasons. Address A.D.A. Box No. 355.

•

NEW JERSEY—Red Bank. For rent. Two-chair office, provision for third. Attached six room house living quarters. Excellent location. Contact Dr. Arthur Kraut, 33 Harding Rd., Red Bank, N. J.

•

NEW JERSEY—For sale. Home-office combination located in picturesque Hunterdon County. Enjoy virtual dental monopoly. Excellent opportunity for industrious practitioner. Owner leaving to specialize. Address A.D.A. Box No. 301.

•

NEW YORK—For sale. Modern dental office and active general practice. Established 50 years—two generations. Located in fast growing borough New York City. Leaving state but will remain to introduce. Favorable terms. Address A.D.A. Box No. 303.

•

OHIO—Cincinnati. For sale. Very fine combination home and two-chair dental office in prestige suburban location. Sale of practice is not involved. Address A.D.A. Box No. 356.

•

OHIO—Central. For sale. Completely equipped bungalow type dental office. Three operatories—two fully equipped with latest Ritter equipment. Well established in small, fast growing community. Large drawing area. Address A.D.A. Box No. 357.

•

OREGON—For sale. Modern, air conditioned, ground floor dental office. Two operating rooms, reception room, business office, laboratory and dark room. Fast growing community 28 miles from Portland. Reasonable price. Terms. Reason for selling—arthritis. Address A.D.A. Box No. 358.

•

PENNSYLVANIA—Norristown. For rent. Modern, two-operating room dental office. Equipped with two Airotors, sterilizing equipment, laboratory, etc. Tenant will take over (permanently) exceptionally large upper middle class practice grossing over $33,000 per year. Owner going into specialty. Address A.D.A. Box No. 307.

•

WASHINGTON—Medical-dental building to be built in Edmonds. Close to new Stevens Memorial Hospital and Edmonds Senior High School. Amazing growth area. Inquiries invited from dental/medical personnel interested in locating in this area. Contact R. E. Leith, 2138 N.E. 81st, Seattle 15, Wash. Phone LA 4-2466.

•

WISCONSIN — For sale. Two-chair fully equipped office including laboratory, darkroom, x-ray, air conditioner. Active practice. Former owner deceased. Population 31,000, 85 miles north of Milwaukee. Write to Mrs. Gene J. McCully, 1125 N. 12th St., Manitowoc, Wis.

WISCONSIN—For rent. Modern dental office in a large residential section. Ample parking; private parking for tenant. Will remodel to suit. Reasonable rent. Ready for immediate occupancy. Write Art Huebner, 2002 13th Ave., South Milwaukee, Wis., or call SOuth 2-3232.

OPPORTUNITIES AVAILABLE

FLORIDA—Associate wanted. New practice, modern office, good fees. Lovely Florida community. Address A.D.A. Box No. 359.

•

MINNESOTA—Wanted. General practitioner for full time associate. Busy, modern office Twin City area. Age late twenties or early thirties. Give full background and references in reply. Address A.D.A. Box No. 360.

•

NEW MEXICO—Grants. Population and trading area of 30,000 needs dentists. Office facilities available. Will help set up practice or hire. Address G. R. Gutierrez, M.D., 1010 Roosevelt Blvd., Grants, New Mex.

•

Upstate New York opportunity for young dentist in all purpose medical group whose decentralized program is expanding. Academic environment. Address A.D.A. Box No. 270.

•

Dentist with substantial practice in New York City suburb requires a junior associate with character and capacity to develop and inherit. Full details as to educational and professional qualifications are requested. Address G. B. Steele, 460 W. 24th St., New York 11, N. Y.

•

NEW YORK—Buffalo. Wanted. Male or female associate. Dentistry for children. Excellent opportunity. Choice suburban area. Give references, postgraduate training, general qualifications. All replies confidential. Address A.D.A. Box No. 272.

•

UNIVERSITY OF MALAYA IN SINGAPORE —Applications are invited for appointment to the Chair of Prosthetic Dentistry. Salary between £2268 and £2548 per annum at a fixed point to be determined by qualifications and experience. Allowances: expatriation, £378 per annum; variable (temporary), in range £210—£560 per annum; clinical, £700 per annum (figures given in sterling). Passages for appointee, wife and children under 12 years. Part furnished quarters at reasonable rent. Provident Fund Scheme. Detailed applications (nine copies) naming three referees by 30 June 1961 to Registrar, University of Malaya in Singapore, Cluny Rd., Singapore 10, from whom further particulars may be obtained.

DENTAL ASSISTANT

Dental assistant wanted. The Dental Department, Wichita Falls State Hospital, has an opening for an experienced dental assistant. Good employee benefits, excellent working conditions, good salary. Lodging, meals and laundry can be furnished at nominal cost. If interested please contact Frank B. Hendricks, Personnel Officer, Wichita Falls State Hospital, Box 300, Wichita Falls, Texas.

HYGIENISTS

Hygienist wanted. Prophylaxis and x-ray only. Hygiene practice established ten years. Contact Dr. John N. Wettaw, 206 Albert St., Bloomington, Ill.

•

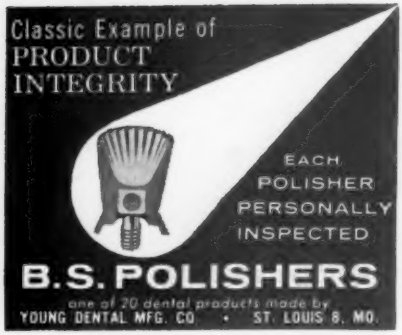
NEBRASKA—Omaha. Hygienist wanted. Good opportunity with group practice doing complete dentistry. Modern office. Five day week. Salary open. Must be interested in patient education. Address A.D.A. Box No. 276.

OPPORTUNITIES WANTED

CALIFORNIA—Prosthodontist, Board certified, experienced in cleft palate and maxillofacial prosthesis, desires association in clinic or office in San Francisco bay area. Moving from East. Available July or August. California licensed. Address A.D.A. Box No. 361.

•

Dentist completing military obligation July 1961, age 27, family, 1959 graduate St. Louis University, seeking association, purchase or lease of dental office. Prefer Kentucky, Tennessee or Alabama area. Address A.D.A. Box No. 362.



Dentist, New York licensed, National Boards, age 28, married, 1959 graduate, completing military obligation December 1961, interested in general practice in Syracuse-Rochester area or state of Maryland. Address A.D.A. Box No. 363.

•

New Jersey-New York licensed dentist, 1959 graduate, age 29, married, desires association either temporary or leading to partnership or purchase in New Jersey. Postgraduate training in prosthetics and endodontics. Military obligation completed August 1961. Address A.D.A. Box No. 364.

•

Dentist, after 25 years of highly rewarding general practice, financially secure, at age 50 seeking change of pace and environment preferably in foreign land. What have you to offer? Address A.D.A. Box No. 365.

•

Dentist age 28, married, have National Board Certificate, Indiana and Colorado licensed. Military obligation completed. Have extra training and experience in all phases of dentistry including private practice. Interested in position with industry, government or group practice including foreign contracts. Address A.D.A. Box No. 366.

•

Dentist age 27, married, military obligation completed, experienced, desires new location or association with progressive general practitioner with option to purchase practice. Southern New Jersey or Philadelphia area preferred. Address A.D.A. Box No. 367.

•

Dentist 1959 Tufts graduate, married, age 28, military service completed July 1961, seeks orthodontic preceptorship. Concentration edgewise technic. Willing to take necessary boards for the right position. Address A.D.A. Box No. 368.

•

PENNSYLVANIA—Dentist, married, military obligation completed, age 30, desires association or association leading to purchase or outright purchase of practice. Pennsylvania or Ohio preferred. National Boards. Address A.D.A. Box No. 369.

Dentist, age 42, veteran, married, family, nine years' successful general practice, seeks position with public health, industry or institution. Salary or contract, foreign or domestic. References. Address A.D.A. Box No. 289.

•

Oral surgeon, veteran, 34, experienced in private practice, all types anesthesia, desires location or association with surgeon. New York, New Jersey, Ohio, Florida and National Boards. Available immediately. Address A.D.A. Box No. 370.

•

Dentist, Northwestern graduate, age 30, married, military obligation completed, five years' successful general practice, seeks position with industry, institution or public health. Prefer South, Southwest or West Coast location. Address A.D.A. Box No. 371.

•

Oral surgeon, Board diplomate desires association, partnership or teaching position in large city either southern United States or West Coast. Will consider group or hospital arrangement or foreign teaching position. Address A.D.A. Box No. 372.

•

Dental hygienist licensed in Ohio, West Virginia and Maryland desires position. Will accept guaranteed basic salary and commission. Three years' experience. Address A.D.A. Box No. 373.

WANTED TO BUY

MISSOURI—Wanted. Late model used dental unit. Left-handed handpiece, chair, light and cabinet. Address A.D.A. Box No. 374.

FOR SALE

FLORIDA—For sale. S. S. White unit, D-2, cream white with spray attachment. Like new condition. Address A.D.A. Box No. 375.

•

MARYLAND—For sale. Borden Ritter Airotor with tandem jet spray, like new. Also bearing replacement kit. Contact Dr. R. F. Ruskin, 1437 Fuselage Ave., Middle River 20, Md.

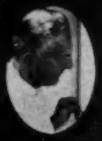
•

MISSOURI—For sale. Weber Unette, biscayne blue with water and air syringes, used very little and just like new, two and one-half years old, $315. Address A.D.A. Box No. 376.

•

MONTANA—For sale. Two Ritter G-1 dental units, excellent condition, coral and green; two Castle Panovision lights, black. Contact Dr. G. Dachs, 795 Sunset Blvd., Kalispell, Mont.

CREST is the first and only dentifrice recognized by the American Dental Association as effective against caries.



It can be a valuable supplement to your program of regular, preventive care.

Won't you suggest CREST to every patient who can benefit from this added protection?

THE COUNCIL ON DENTAL THERAPEUTICS' RESOLUTION:

"Crest has been shown to be an effective anticaries dentifrice that can be of significant value when used in a conscientiously applied program of oral hygiene and regular professional care; Crest dentifrice may also be of value as a supplement to public dental health procedures."

J.A.D.A. 61:272 (1960)

Fluoristan is Procter & Gamble's registered trademark for an exclusive combination of stannous fluoride and a fluoride-compatible polishing agent.

PROCTER & GAMBLE • DIVISION OF DENTAL RESEARCH • CINCINNATI 1, OHIO

Total unit value	$68.15	**CONTENTS**
Price	51.60	15 Powders
Saving	$16.55	3 Liquids—1 Color Guide

S. S. WHITE PRODUCTS GIVE YOU *HIGHEST VALUE* FOR YOUR

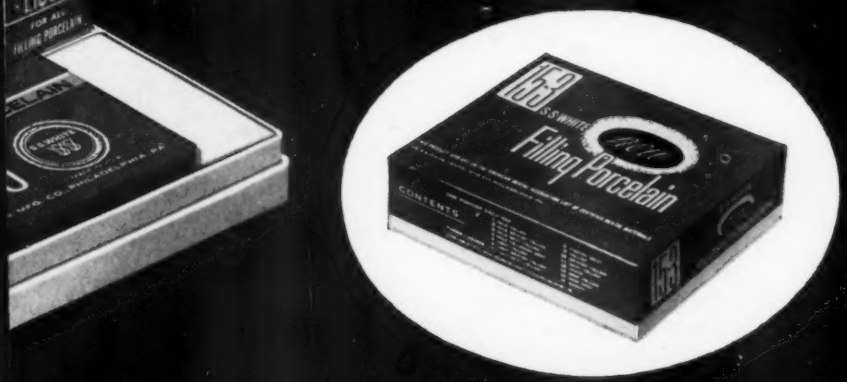
S. S. WHITE

new

Filling Porcelain

15-3 PACKAGE

introduces two new colors



Two new colors . . . No. 8 Pinkish Gray, a tooth color and No. 15 Brown, a modifying color have been added to the New Filling Porcelain line. For a complete set of New Filling Porcelain colors assuring uniformly superior silicate fillings, order the new 15/3 Package.

THE S. S. WHITE DENTAL MFG. CO., PHILA. 5, PA.

DOLLAR, WITH THE *BEST IN QUALITY* FOR YOUR PRACTICE.

IT'S TIME AGAIN...

. . . to order your official ADA Appointment Book for 1962. The popular design and format of the 1961 book will be repeated again this year.

The 1962 ADA Appointment Book will include the following, helpful features:

- 8 a.m. to 9 p.m. scheduling with spaces indicated for quarter, half and one hour appointments.
- Week-at-a-time layout allows you to see your entire week's schedule at a glance.
- Important, practice-maintaining Patient Recall System in back of book.

Let an efficient ADA Appointment Book keep you on schedule next year. You will be scheduling your early '62 appointments soon—so order your copy today. The price? Still only $3.00.

— — — — — — — — — —

Order Department
American Dental Association
222 East Superior Street
Chicago 11, Illinois

Please send me_____copies of the ADA Appointment Book at $3.00 per copy. My remittance is enclosed.

Name_____

Address_____

City_____ Zone____ State_____

652

NEW
BULK
PACKAGE
SAVES
MONEY . . .

Your master KEY to superior impressions

Modern formula assures sharp, fast-setting impressions at rock-bottom cost. **Key to Alginates** mixes quickly to a creamy, firm-bodied consistency. It flows smoothly without running.

This all-purpose alginate impression material is extremely sharp setting . . . sets fast without distortion. Impressions can be removed from the mouth in 30 seconds. Remarkable elasticity permits removal over severe undercuts. Stone or plaster casts are smooth and clean, reflecting superb accuracy with absolute dimensional perfection.

Key to Alginates is packed in economy-priced, airtight bulk containers for lowest cost-per-impression. Outstanding quality . . . remarkably low in price, only $3.00 per tin.*

Prove to yourself the real value of this superior impression material. Order a tin from your dental supply dealer today.

*In case lot of 12 tins.

Dimensional Perfection

dental perfection co., inc.
543 West Arden Avenue, Glendale 3, California

℞ FLUORITAB

1 milligram of fluorine

FLUORIDE TABLETS

suggested retail price — **$1./100**

Available in drug stores on your prescription or for dispensing in your office

Complete information, J.A.D.A. reprints, samples, dispensing labels, prices, and prescription instructions, furnished free upon request. Write to:

Fluoritab Corporation, 625 South Saginaw Street, Flint 2, Michigan

---

MOVING?

Sending us your new address and postal zone in advance will help to avoid any interruption in the delivery of your A.D.A. Journal.

Name_____

Old Address_____

_____

New Address_____

_____

_____ Zone_____

☐ Private Practice ☐ Student

☐ Federal Dental Service

Mail to: Bureau of Membership Records, American Dental Association, 222 East Superior Street, Chicago 11, Illinois

designed for the general practitioner

Stay informed of new developments in these 3 important areas of dentistry —oral surgery, anesthesia and hospital dental service.

Not just a specialty journal but a publication edited to aid you, as a general practitioner.

Order now. Six 96-page issues a year. Rates: $10. ($12 overseas)

Subscription Dept. 660
American Dental Assn.
222 E. Superior St.
Chicago 11, Ill.

journal of oral surgery anesthesia and hospital dental service

Good to the last squeeze

Why was this not done long ago? you'll think, after your first mix. Liquid in tubes is so convenient—no bottles to tip—no pipettes. Because liquid is fully protected from loss or absorption of moisture it will not deteriorate—you can use it to the last squeeze.

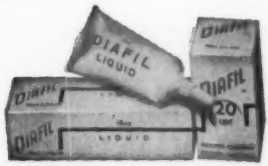
No change in the product — you are still getting your preferred filling material.

At a sensible price

Powder (18 gms.) $3.60 per bottle
Liquid (15cc) 1.20 per tube
(Or slightly less in quantity purchases)

DIAFIL

For anterior and posterior fillings
In its new, modern packaging



Write for free sample
(Sample liquid in bottle only)

PFINGST & COMPANY, INC.
62 COOPER SQUARE • NEW YORK 3, N.Y.

THE BIRTCHER
HYFRECATOR®

HI-FREquency desicCATOR (not a hot-wire cautery)

Unrivalled for all technics of Desiccation and Fulguration

Exposure of cavity margin for indirect impression technics

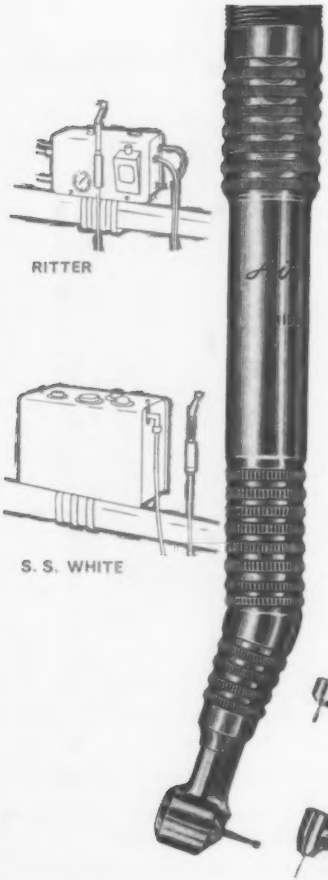
Hemostasis—post extraction and nuisance bleeding from instrumentation

Reprints of several excellent papers on Dental Hyfrecation plus a new "Question and Answer Booklet" are available on request

THE BIRTCHER CORPORATION Dept. A.D.A. 661
4371 Valley Boulevard
Los Angeles 32, California

Send me reprints and the new booklet "45 Questions and Answers on Dental Hyfrecation"

Dr. _____
Address _____
City _____ Zone ____ State _____
My Dental Supply Dealer is _____



ADAPT

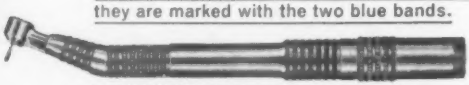
the midwest miniature air-drive contra angle to your present airotor

QUICKLY!

WITHOUT INSTALLATION

NEW MIDWEST ADAPTOR FOR MINIATURE AIR DRIVE CONTRA ANGLE PROVIDES MORE VERSATILITY TO S. S. WHITE AND RITTER AIROTOR UNITS

Furnished with Miniature and Standard Air Drive "400" contra angles. This new adaptor is furnished without additional charge and simply screws on to existing hoses. No need to change contra angle tubing or re-adjust oiling systems. Two blue color bands on sheath distinguish this special contra angle from other Midwest contra angles... IMPORTANT: do not use Midwest contra angles on Airotor units unless they are marked with the two blue bands.



No. 433-4MS Miniature Air Drive "400" for use on S. S. White and Ritter J Airotors

No. 433-4MR Miniature Air Drive "400" for use on Ritter Airotor units with Quick Disconnect (Except Ritter J)

No. 432-3SS Air Drive "400" Contra Angle for use on S. S. White and Ritter J Airotors

No. 432-3SR Air Drive "400" Contra Angle for use on Ritter Airotor with Quick Disconnect (except Ritter J)

If you plan to use the Midwest Air Drive Angles exclusively, we recommend

PERMANENT CONVERSION ADAPTOR FOR ALL MAJOR AIR TURBINE UNITS

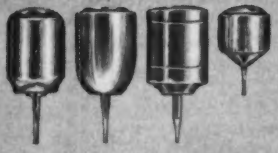
You can adapt the Midwest Miniature and the Midwest Standard Air Drive "400" contra angles to S. S. White, Ritter, Densco and Weber equipment and have the benefit of the drive air being exhausted in a special receptacle in your control cabinet. An adaptor is also supplied for your original contra angle for emergency use.

Conversion kit comes with adaptor, exhaust air receptacle, contra angle hose and necessary connections. Please furnish make and model of dental unit and air handpiece control box when ordering.

For Densco and Weber control boxes, conversion parts are furnished at no extra charge providing both Miniature and Standard angles are purchased and used exclusively. Exhaust air will then be exhausted back into the cabinet.

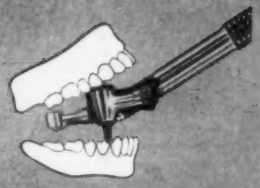
MIDWEST'S MINIATURE AIR DRIVE CONTRA ANGLE

Permits effortless and precise cavity preparation...even in posterior regions. Permits maximum effective cutting procedures in primary teeth. Affords better vision to the operator and permits him to work in confined areas with complete control, safety and comfort to the patient.



SHORTER BY 7MM NARROWER BY 1MM

PROVIDES EASIER ACCESS TO POSTERIOR REGIONS



MINIATURE DIAMONDS

I-R 5-IC 16-C 20-C 11-TC 15-TC

MINIATURE CARBIDE BURS

½	33½	57	170
2	35	557	171
4	37	558	701

MIDWEST'S MINIATURE DIAMONDS AND CARBIDE BURS

Midwest's Miniature Carbide Burs and Miniature Diamonds are made exclusively for Midwest Miniature Contra Angles...Guaranteed to have a perfect relationship with the contra angle and provide greater precision. The overall shortness in the Miniature head of the contra angle permits you to make preparations never before possible with larger head angles.

MD

MIDWEST DENTAL MANUFACTURING CO.

1980 N. HAWTHORNE MELROSE PARK, ILL.

TO EVERY AMERICAN DENTIST:

*An invitation to read the proud story of an Association . . . **your story . . . your Association!***

A HISTORY OF THE AMERICAN DENTAL ASSOCIATION

by R. B. McCluggage, Ph.D.

The exciting narrative of organized dentistry on the American scene—its trials, division and final unification in the turbulent years from 1859 to the present.

Vividly written by a gifted young American historian, *A History of the American Dental Association* is a fast-moving account of dentistry's progress portrayed against the colorful backdrop of the growing young nation.

In reading this absorbing one hundred year narrative everyone holding a dental degree will take new pride in his profession and in the part played by its national association.

A History provides that sense of historical perspective that is so essential to the professional man. It belongs on every dentist's shelf. Available now in the regular, case-bound edition for $8.00. Order your copy today.

AMERICAN DENTAL ASSOCIATION
Order Dept., 222 East Superior Street
Chicago 11, Illinois

Please send me *A History of the American Dental Association.*

My remittance in the amount of $8.00 per copy is enclosed.

Name_____

Address_____

City_____ Zone___ State_____

654

Dentists TELL Dentists... that's why Cavitron Ultrasonic Dentistry is Becoming Standard Equipment

Today when a group of dentists is seeing for the first time how the Cavitron Periodontal and Prophylaxis Unit removes all deposits so effortlessly through ultrasonics, there's usually one doctor in the crowd who announces to his colleagues, "I have one of those units and it's the best piece of equipment in my office."

Or another of the 5,000 dentists who use Cavitron will say to a dentist next to him, "I wouldn't go back to those old hand scaling instruments for anything. Cavitron has changed my whole outlook on prophylaxis."

One dentist even took the instrument from our representative at a recent meeting and demonstrated it to a friend, explaining rather aptly, "You see — it's as easy as using an eraser."

Many doctors visit our booth especially to thank us for bringing them the Cavitron. They can't say enough about how much easier it is on their patients and themselves, even when deep, sensitive pockets are involved. They are particularly delighted with how "Cavitroning" has increased their productive hours and of course their income from prophylaxis and periodontal treatment. They also tell us how effective it is in other procedures such as gingivectomy, amalgam condensation, orthodontics and cementation, and root canal therapy.

☐ **To help us bring to** the entire profession the experience of dentists who are now so enthusiastic about ultrasonics in dentistry, we are conducting an essay contest on the subject, "How the Cavitron Unit Has Helped Me in My Practice." Some doctors may wish to enter their essays on the subject of "The Cavitron as a Practice Builder." The grand prize is an all-expense trip to Hawaii for two. Fill out the blank below for details of the contest.

☐ **Or check the coupon to** receive our new booklet, "The Last Word on Patient Recall."

☐ **Also, if you would like** to arrange a special clinic or study group on ultrasonic dentistry, we can suggest authorities in this field.

It's always good to hear from dentists, especially with the growing number of favorable reports that the Cavitron Periodontal and Prophylaxis Unit is becoming standard equipment in dental offices.

Carleton Ellis, Jr., President

☐ Send me the Contest Rules ☐ Send me "The Last Word on Patient Recall"

I would like an office demonstration of:

☐ Cavitron Periodontal and Prophylaxis Unit ☐ Audio-Sonic Unit

☐ We'd like to arrange a group meeting on ultrasonic dentistry

Name_____
(please print)

Address_____ My dealer is_____

CAVITRON CORPORATION

42-15 Crescent Street

Long Island City 1, New York

WITH

JELCONE

a new technic for

TREATMENT RELINE

When a denture patient complains of irritated tissues or discomfort from a wobbly restoration, the dentist now can remedy the condition immediately: temporary, "soft" reline with *Jelcone*, Caulk's unique *and shelf-stable* silicone impression material.

The technic is easy. The patient gets instant relief. Permanent rebasing can be arranged at a later and more appropriate time.

For precision dentistry, too, Jelcone is the completely reliable silicone impression material. Let it prove its worth right in your office.

And for peak precision in rubber base impression materials

RUBBERJEL

for crowns, inlays, bridges, dentures

For modern materials call on CAULK

Milford, Delaware

Ready
for
finishing
... in just 5 minutes!

With Bonfil, Caulk's new and unique resin filling material, you can proceed with finishing only five minutes after completing the filling! There's no need for another appointment, no embarrassing delay for the patient.

Efficiently placed by brush or by the flow procedure, Bonfil adapts tightly to cavity surfaces . . . matches tooth enamel in appearance . . . sets with a *snap* . . . remains colorfast. Completely compatible with the tooth, it brings new freedom from clinical disadvantages occasionally associated with other resin filling materials.

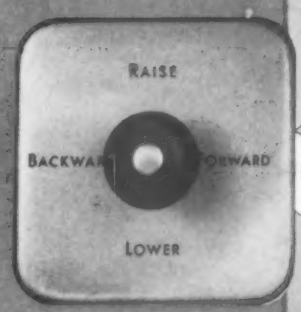
BONFIL

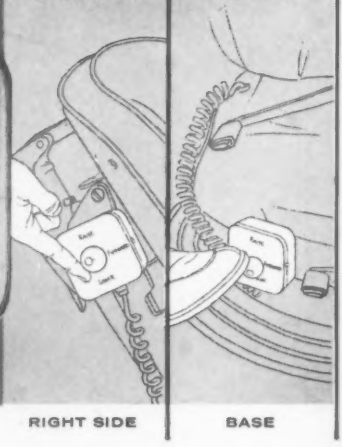
For modern materials call on CAULK
Milford, Delaware

NOW Exclusive MULTI-POSITION POWER

. . . Clips on any of 3 convenient locations . . . or select your own locations!

- SMOOTHLY RAISES OR LOWERS CHAIR, AND
- TILTS THE BACK . . . FORWARD OR BACKWARD





RIGHT SIDE BASE

DYNADJUST

TYPE 1 Exclusive Fluid-Float seating relaxes your patients in new body-contoured comfort . . . in the right position for every operating procedure. And so easy! Just clip the exclusive Multi-Position Power Control into any of the three brackets on the chair (or select other locations) . . . lightly touch the button . . . and float your Ritter DYNADJUST Chair through today's widest range of tilting and elevation. Attractive lounge-type seat, genuine leather.

RUSH COUPON FOR FULL-COLOR STORY ON AMERICA'S NEWEST DENTAL CHAIRS . . . AND SEE THEM AT YOUR DEALER'S!

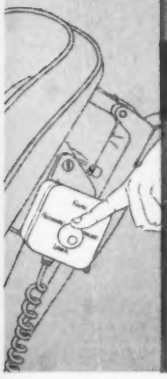
CONTROL... Exclusive FLUID-FLOAT SEATING!

ON THE NEW

RITTER

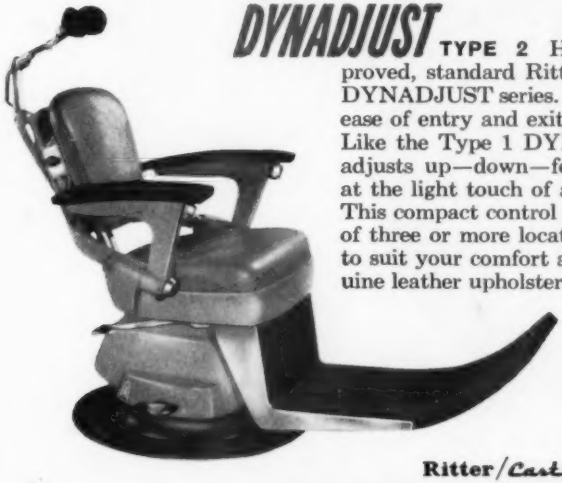
DYNADJUST* CHAIRS

THE LIGHT TOUCH CONTROL BY FINGERTIP, TOE OR KNEE!



LEFT SIDE

*Trademark of Ritter Company Inc.



DYNADJUST TYPE 2 Here is the famed, proved, standard Ritter Chair in the new DYNADJUST series. Utmost comfort plus ease of entry and exit highlight this chair. Like the Type 1 DYNADJUST Chair, it adjusts up—down—forward—backward—at the light touch of a finger, toe or knee. This compact control can be placed in any of three or more locations on either chair, to suit your comfort and procedures. Genuine leather upholstery.

Ritter/Castle ...FINER PROFESSIONAL EQUIPMENT

Ritter Company Inc.

RITTER COMPANY INC.
3406 Ritter Park
Rochester 3, New York

Please send colorful brochure fully describing the new Ritter DYNADJUST Chairs.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE____

EXCLUSIVE

fine grain

Gives Resiliency to TICONIUM Partials

ORDINARY TICONIUM

Photomicrographed cases specially etched to show grain structure.

You can't tell a good partial by its looks because most look alike. Ticonium is different! For instance, every Ticonium partial contains a fine grain structure which provides superior strength. Insist on Ticonium from your Ticonium franchised laboratory.

A GROWING CMP INDUSTRY

TICONIUM

DIVISION OF CMP INDUSTRIES, INC.
ALBANY 1, NEW YORK

You can always count on best results with COE-FLEX

Why will you enjoy using Coe-Flex? The answer is that this outstanding rubber-base material *delivers* everything you want in an impression material. To be specific: Its physical properties are quite beyond the existing standards and specifications of hydrocolloids and alginates. It is accurate—very definitely so. It is dimensionally stable, safe and easy to use, strong, tough, and correctible. Actually, Coe-Flex is a truly universal impression material. It is used—and liked—by thousands of dentists for crown and bridge impressions and for partial and full denture impressions.

Coe-Flex mixes easily, speeds up impression taking, conserves chair time, can be poured as will . . . Patients like its pleasant flavor and the gentle, comfortable feeling of the material in the mouth. Technicians like Coe-Flex because it assures better fitting cases, and because make-overs are so seldom necessary.

Coe-Flex is available in the viscosity you prefer: Coe-Flex Regular for the average mix; Coe-Flex Heavy for the most viscous mix; and Coe-Flex Injection Type for a fluid mix for use in the Coe-Flex Syringe.

Only $5.50 per pkg. at your dealer's... Please specify type desired when ordering.

•

U.S.A. Prices. Elsewhere slightly higher.

Order from your dealer

Coe LABORATORIES, INC.
CHICAGO 21, ILLINOIS

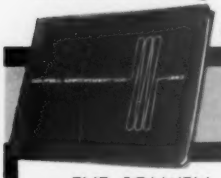
COLWELL'S 1962 APPOINTMENT LOG

YOUR ENTIRE WEEK'S APPOINTMENTS ON ONE SPREAD OF PAGES

- Eliminates day-by-day page thumbing
- Minimizes appointment mix-ups
- Saves time and trouble

COLWELL'S APPOINTMENT LOG reveals your entire week's appointments at a glance. Two columns per day for two doctors officing together — or for patients' names and service to be given.

Hours from 8:00 A.M. to 5:45 P.M. with space for evening appointments. QUARTER-HOUR BREAKDOWNS. Special section at end of book provides sheets for each month of the following year on which to note recall dates. Page size 8¼ x 10¾. Smooth white ledger paper printed in brown and green. One-piece flexible cover; tear-resistant binding.



Satisfaction Guaranteed

ORDER NOW!

THE COLWELL COMPANY
262 Kenyon Road, Champaign, Illinois

☐ Please send me COLWELL'S APPOINTMENT LOG for 1962. Check for **$3.00** enclosed.

☐ Please send me COLWELL'S APPOINTMENT LOG for remainder of 1961 at the reduced price of **$1.50**. Check enclosed.

NAME _____ Degree

ADDRESS _____

CITY _____ STATE _____

RAPID in DESTRUCTION

of commonly encountered
VEGETATIVE BACTERIA
Free from Phenol (Carbolic Acid) and Mercurials

BARD-PARKER

CHLOROPHENYL

This Powerfully Efficient Instrument Disinfecting Solution for **WARD—OFFICE—CLINIC IS . . .**

- **Non-corrosive to metallic instruments and keen cutting edges**
- **Non-injurious to skin or tissue**
- **Free from unpleasant-irritating odor**
- **Non-toxic—stable for long periods**
- **Potently effective even in the presence of soap**
- **Inexpensive to use**

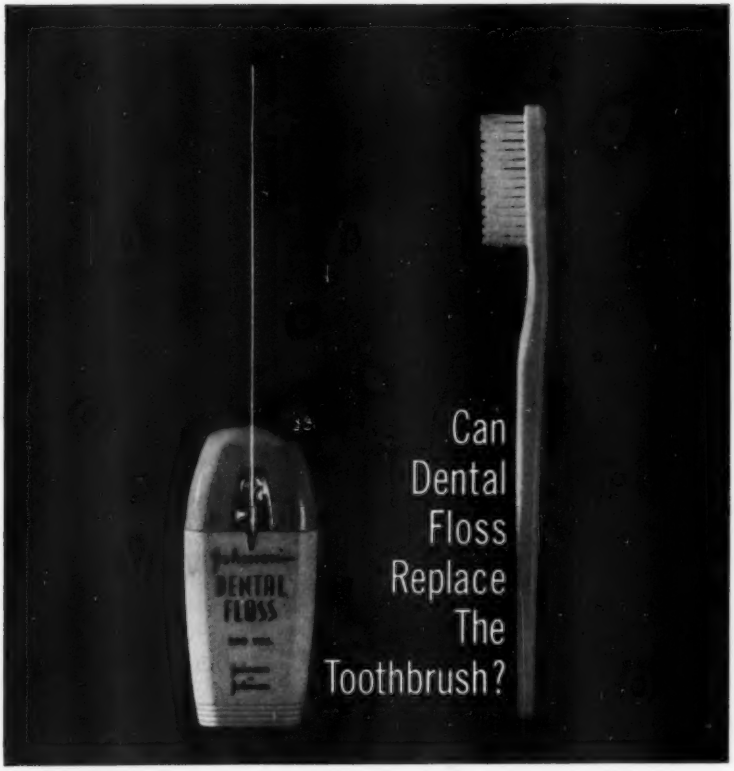
B-P INSTRUMENT CONTAINER No. 300
Accommodates up to an 8" instrument. Ideally suited for use with Bard-Parker CHLOROPHENYL

Ask your dealer

B-P BARD-PARKER COMPANY, INC.
DANBURY, CONNECTICUT
A DIVISION OF BECTON, DICKINSON AND COMPANY

B-P and CHLOROPHENYL are trademarks

ALL BARD-PARKER SOLUTIONS CONSERVE THE BUDGET DOLLAR



Of course not. But dental floss can prove an invaluable supplement to the toothbrush in the control of caries.

Regular use of dental floss, moreover, seems to make people more "teeth conscious." According to a recent survey, floss users brush more often than non-users . . . 90% brush at least twice daily. They spot defects sooner . . . see their dentist more often, too.

Clearly, for both the dentist and the patient, dental floss can be a valuable ally in the fight for better dental health.

Johnson & Johnson

FREE BOOKLET FOR YOUR PATIENTS Mail Coupon

JOHNSON & JOHNSON, Dept. A-2, New Brunswick, N. J.

Sirs: Please send me_____(quantity) copies of "How to Use Dental Floss."

Name_____

Address_____

City_____ Zone____ State_____

ARE YOU SURE

YOU RECEIVE GENUINE VITALLIUM®?

When you request Vitallium and you do not receive your partial denture in either of these containers, it is not genuine Vitallium.

AUSTENAL COMPANY

EACH DENTURE IS DELIVERED IN EITHER OF THESE SEALED CONTAINERS

PRESCRIBE Vitallium partial dentures to be sure you receive the finest tested and certified alloy with the highest quality custom craftsmanship.

Your chairtime hours are extremely important in today's busy practice. High quality Vitallium partials can conserve your chairtime.

- - - division of HOWE SOUND COMPANY - - - NEW YORK - CHICAGO

® By Austenal Company

In 1961, some 13,300 cases of oral cancer will be diagnosed. Of these, only 5,000 will be cured! It is a tragic paradox that the cure rate should be so low for a cancer that is accessible and comparatively easy to detect in its early and curable stages.

Since the patient himself is often not alerted to oral cancer by pain or even by a danger signal, the dentist's responsibility is crucial. In his routine examinations of the patient's oral cavity, he has the opportunity to recognize asymptomatic lesions that may be early, curable cancer.

More and more patients are having periodic dental checkups. Their number must increase if oral cancer is to be better controlled. The American Cancer Society's public and professional educational efforts encourage earlier case findings by stressing the importance of regular health checkups and professional consultations when symptoms develop. Implementing these efforts are films, publications, exhibits, speakers. Information may be obtained at local units of the

AMERICAN CANCER SOCIETY®

® By Austenal Company

YOU'LL ALWAYS NEED A LOW-SPEED HANDPIECE...

While higher speed rotary instruments offer advantages for greater operating efficiency in certain areas, high speed applications are **limited.** Without question, the properly outfitted dental office needs both the upper and the lower range of speeds.

A low-speed handpiece will always be required for excavating caries, cavity preparation, prophylaxis, refining and finishing cast restoration — to name just a few exclusively low speed jobs.

Dentists everywhere are now taking advantage of the fact that Superba offers the finest straight handpiece contra angle and prophy angle—guaranteed—at an irresistibly low price. These Superba instruments are manufactured to exacting American specifications, under meticulous Superba quality control.

. . . EQUIP YOUR OFFICE WITH THE VERY BEST!

The Superba Doriot handpiece fits comfortably in your hand—is precision-built to extremely close tolerances. Smooth, minimum-noise performance combines with proven best-quality features for longer wear, greater reliability. Superba handpiece, contra angle and prophy angle are all sold with Superba 90-day warranty.

Handpiece $18.00 **Contra Angle $7.50** **Prophy Angle $7.50**

Nearest major competing brands with these same features and guarantee more **than twice the Superba price on these items!**

ALL PRICES INCLUDE POSTAGE (Add 4% sales tax on Calif. orders)

SERVICE TO DENTISTS THROUGHOUT THE WORLD

Superba

DENTAL PRODUCTS INCORPORATED

Superba handpieces are also available through your dealer.

To: SUPERBA DENTAL PRODUCTS, INC.
Box 9322
San Diego 9, California

Dr.....
Address.....
City.....
Zone..... State.....

- ☐ 1 Superba Doriot handpiece $18.00
- ☐ 1 Superba Contra Angle $7.50
- ☐ 1 Superba Prophy Angle $7.50
- ☐ All three at $30 special price
- ☐ Catalog & Superba literature
- ☐ Check Enclosed ☐ Bill Me

ADA-9

GALETTI-LUONGO

Plasterless Articulator

INDISPENSABLE FOR THE PROGRESSIVE PRACTITIONER

ARTICULATE MODELS WITHOUT PLASTER IN LESS THAN ONE MINUTE

Made in Italy
Pat. in U.S.A. and Foreign Countries

Rapid mounting of models — without using plaster — for partial and full dentures. With mechanical fixation of models.

This new Articulator serves well in the Dentist's Office for the Doctor to check the bites taken at the time the patient is in the dental chair by transferring immediately the placement of the Casts to the Articulator on hand with both Casts made secure.

- Articulate models in correct occlusion without using plaster, in less than one minute.
- Can be successfully used for all practical cases in the laboratory at a saving of time.
- Terrific diagnostic instrument at dental chair for case presentation of study casts to patient.
- Not just another articulator—the most revolutionary, time-saving, best instrument ever developed.

PRICE $35 EACH — available through all reputable dealers

Descriptive booklet on request.

JOHN O. LUONGO

Exclusive distributor for U. S., Canada, South America

ONE HANSON PLACE BROOKLYN 17, N. Y.

You can say it with words or you can say it with pictures, but it's best to say it with . . .

COLUMBIA DENTOFORMS

If you do not have our Catalog #33, *write* for your copy today.

COLUMBIA DENTOFORM CORP.

"The House of A Thousand Models" and Home of Brown Precision Attachments

131 E. 23rd St. • New York 10, N.Y.

$1,000 to $5,000

Personal Loans to Professional Men

Strictly Confidential

A nationwide Executive Loan Service designed for responsible professional men as a convenient supplementary source of personal credit. No collateral, no endorsement, no embarrassing investigation. All details handled by mail from the privacy of your office. Monthly repayments up to 2 years if desired. References:

Chase Manhattan Bank of New York
First National Bank of St. Paul
Crocker-Anglo National Bank of San Francisco

For full particulars write
MR. A. J. BRUDER, *Vice Pres.*

Industrial Credit Company

St. Paul 2, Minnesota

BAYER

BAYER

1¼ Grs. Ea.
FLAVORED

Living up to a family tradition

There are probably certain medications which are special favorites of yours, medications in which you have a particular confidence.

Dentists, through ever increasing recommendation, have long demonstrated their confidence in the uniformity, potency and purity of Bayer Aspirin, the world's first aspirin.

And like Bayer Aspirin, Bayer Aspirin for Children is quality controlled. For the same manufacturing skill, exclusive processes and testing which contribute to the unsurpassed quality of Bayer Aspirin set the standards of excellence for Bayer Aspirin for Children.

You can depend on Bayer Aspirin for Children for it has been conscientiously formulated to be a pleasant tasting aspirin and to live up to the Bayer family tradition of providing as fine an aspirin as the world has ever known.

Bayer Aspirin for Children—1¼ grain flavored tablets—Supplied in bottles of 50.

● We welcome your requests for samples on Bayer Aspirin and Flavored Bayer Aspirin for Children.

New
GRIP-TIGHT CAP
for Children's
Greater Protection

Accepted
COUNCIL ON DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

THE BAYER COMPANY, DIVISION OF STERLING DRUG INC., 1450 BROADWAY, NEW YORK 18, N. Y.

Improve your skills in anesthetic techniques and provide your patients with more pain-free care

Leonard M. Monheim
B.S., M.S., D.D.S.

Obtain practical, clinical advice and assistance from this authoritative reference set by an outstanding teacher and practicing dentist, Leonard M. Monheim, B.S., M.S., D.D.S.

Ready This Month! *New 2nd Edition*

LOCAL ANESTHESIA AND PAIN CONTROL IN DENTAL PRACTICE

This clinical guidebook, written by Leonard M. Monheim, B.S., M.S., D.D.S., has the reputation of being the most complete source of information available on the concepts of pain and overall pain control as they are applicable to the everyday problems in dentistry. By approaching the subject on a neuroanatomical and psychological basis, this book can give you a more thorough understanding of the principles of anatomy and physiology as they apply to local anesthesia. It is the only book which thoroughly discusses preanesthetic evaluation, the choice of anesthetics and preanesthetic and postanesthetic medications. The new 2nd edition of this book can give you valuable clinical advice on the most widely used injection techniques; it discusses drug and injection complications and shows you how to recognize, prevent and treat them. The pharmacology of drugs is more thoroughly explained in this new edition.

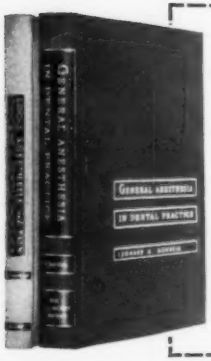
Ready later this month. 2nd edition, approx. 325 pages, 6" x 9", 148 illustrations. About $9.00.

GENERAL ANESTHESIA IN DENTAL PRACTICE

Designed for easy reading and reference, this book gives detailed discussions of general anesthesia as it applies to dentistry. It is the only book available which adequately stresses the basic sciences of anesthesia. The author explains the phases, stages and signs of anesthesia and points up anesthesic complications. He discusses preanesthetic evaluation armamentarium and explains basic techniques of administration. This book together with Dr. Monheim's guidebook on local anesthesia gives you virtually a complete library on every phase of dental anesthesia.

1960, 461 pages, 6" x 9", 114 figures, 26 tables. Price, $10.50.

Order This 2-Volume Set on 30 day Approval!



The C. V. MOSBY Company
3207 Washington Boulevard, St. Louis 3, Missouri

☐ I accept your offer to examine Monheim's 2-volume set on dental anesthesia, priced at about $19.50, on 30 day approval without charge or obligation. A remittance with this order will save the mailing charge.

I prefer to order only a single volume as indicated below:

☐ LOCAL ANESTHESIA AND PAIN CONTROL IN DENTAL PRACTICE ..... About $9.00
☐ GENERAL ANESTHESIA IN DENTAL PRACTICE 10.50

☐ Payment enclosed (Same return privilege)
☐ Charge my account
☐ Open a new account for me

_____, D.D.S.

Address _____

City _____ Zone _____ State _____

JADA-6-61

when they require penicillin...

PEN·VEE® *Oral* and *Suspension*

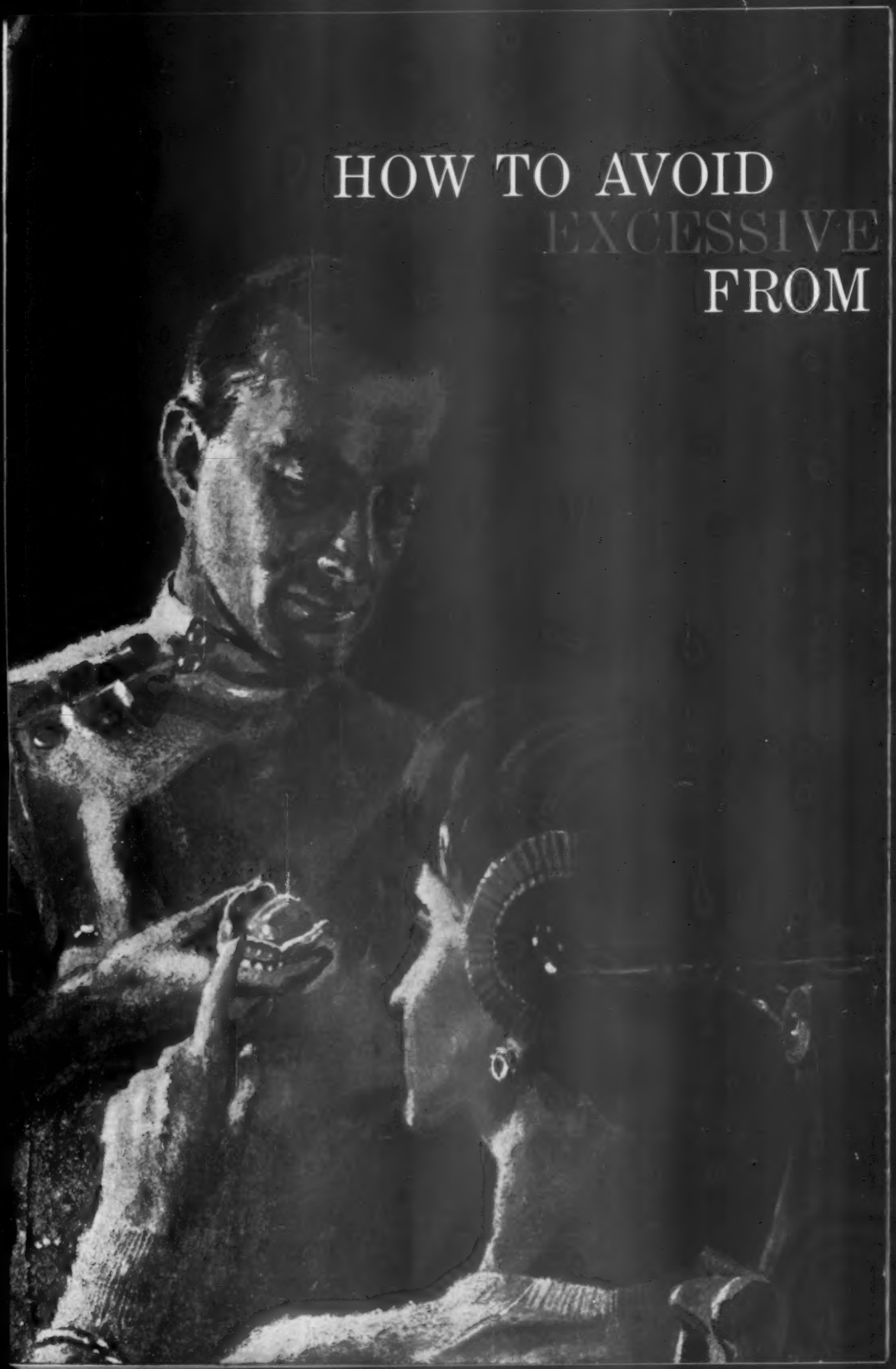
Tablets: Penicillin V, Crystalline (Phenoxymethyl Penicillin);
Suspension: Benzathine Penicillin V Oral Suspension, Wyeth

Your patients with many dental infections receive the benefits of penicillin therapy. PEN·VEE·*Oral* and PEN·VEE *Suspension* provide excellent adjunctive therapy as well as preoperative and postoperative prophylaxis. They are especially useful in office practice because of lower incidence of severe penicillin reactions as compared to injectable penicillin.

Wyeth Laboratories Philadelphia 1, Pa.

Wyeth
SERVICE TO DENTISTRY

Supplied: PEN·VEE·*Oral* Tablets, 300 mg. (500,000 units), vials of 12; 125 mg. (200,000 units), vials of 36. PEN·VEE *Suspension*, 180 mg. (300,000 units) or 90 mg. (150,000 units) per 5-cc. teaspoonful, bottles of 2 fl. oz.


HOW TO AVOID
EXCESSIVE
FROM

COMPLAINTS
NEW
DENTURE PATIENTS

Many dentists have found patients need help in learning to use new dentures successfully. For this purpose the ethical Wernet products increase stability and retention so that the patient gains confidence more quickly. Complaints are replaced by appreciation for your help in the difficult task of mastering new dentures.

Now, when you recommend Wernet's you can offer your patients a choice based on individual preference —Wernet's Powder or Wernet's Adhesive Cream. Whichever they select, you may be confident it is a product of highest quality, ethically presented, professionally accepted.

Let Wernet's help *your* new denture patients—and help save productive chair time.

WERNET'S POWDER
WERNET'S ADHESIVE CREAM

Professional samples available on request.
Recommended by more dentists than any other denture adhesive.

BLOCK DRUG COMPANY, INC.
105 Academy Street, Jersey City 2, N. J.

QUALITY PRODUCTS FOR DENTAL HEALTH

Index to advertisements—June 1961

American Cancer Society....230
American Dental Association
Accepted Dental Remedies—1961....194
102nd Annual Session....174
Application for housing accommodations....2, 3
Appointment Book—1962....212
Dental Abstracts....198
History of the American Dental Association....218
Journal of Oral Surgery, Anesthesia and Hospital Dental Service....214
Moving?....214
Amurol Products Co....240
Austenal Company....228, 229

Bard-Parker Company, Inc....226
Bayer Company, The....233
Birtcher Corporation, The....215
Block Drug Company, Inc....7, 236, 237
Bon Ami Company, The.... 15
Boos Dental Laboratories, Inc., Henry P..175
Bowen & Company, Inc....187
Breon Laboratories, Inc....183
Bristol-Myers Company....173

Caulk Company, The L. D....220, 221
Cavitron Corporation....219
Ceramco....179
Chiclecraft, Inc....192
Church & Dwight Co., Inc....177
Classified Advertising....204, 205, 206, 207, 208
Coe Laboratories, Inc....225
Columbia Dentoform Corp....232
Colwell Company, The....226
Cook-Waite Laboratories, Inc....202, 203
Crescent Dental Mfg. Co....3rd Cover

Dental Absorbents Co....190
Dental Development & Mfg. Corp....182
Dental Perfection Co., Inc....213
Dentists' Supply Co. of N. Y., The.... 16

Eastman Kodak Company....193
Emesco Dental Co....201
Engelhard Industries, Inc....196
Exakta Camera Company....182

Fluoritab Corporation....214

Gesner, Inc., M. A....167
Getz Corporation, The William.... 9
Gomco Surgical Manufacturing Corp....178
Great-West Life Assurance Company, The.195

Hamilton Manufacturing Company....172
Hanau Engineering Co., Inc....163
Heart Fund....200
Howard Tours....190
Hu-Friedy Mfg. Co. Inc....196

Industrial Credit Company....232
Ivory Inc., J. W....184

Jelenko & Co., Inc., J. F.... 1
Johnson & Johnson....180, 227

Kerr Manufacturing Company.... 6
Kumfort-Tyme Co....207

Lederle Laboratories.... 8
Lorvic Corporation, The....159
Luxene Inc.... 12
Luongo, John O....232

McShirley Products....182
Medical Protective Company, The....188
Midwest Dental Manufacturing Co...216, 217
Mizzy, Inc.... 14
Mosby Company, The C. V....234
Myerson Tooth Corporation....161

Ney Company, The J. M....185
North American Philips Company, Inc....176
Nu-dent Porcelain Studio, Inc....4th Cover

Oral B Company....171

Pfingst & Company, Inc....215
Procter & Gamble....209
Professional Budget Plan....239
Professional Printing Company, Inc....201

Rinn Corporation.... 13
Ritter Company Inc....222, 223
Rower Dental Mfg. Corp....192

Saunders Company, W. B....165
Schneider Dental Laboratory, M. W....199
Speyer Smelting & Refining Company....205
Squibb & Sons, E. R....184
Stim-U-Dents, Inc....186
Superba Dental Products, Inc....231
Swissedent....170

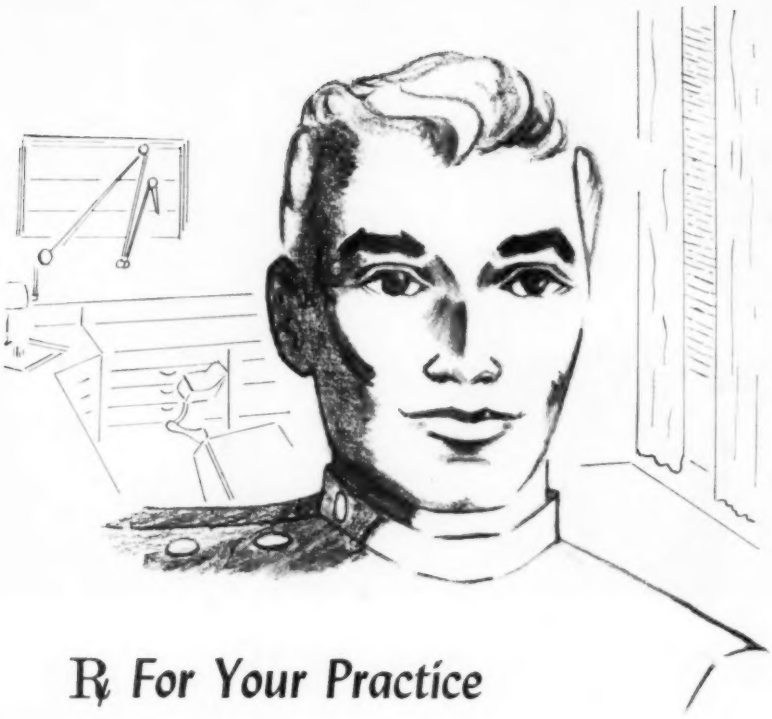
Ticonium....224
Torit Manufacturing Co....169

Union Broach Co., Inc....188, 199
Universal Dental Company....191

Vick Chemical Co....197
Vivadent Corp....4, 5

Weber Dental Manufacturing Company, The....10, 11
Wheat Flour Institute....181
White Dental Manufacturing Co., The S. S....190, 210, 211
Whitehall Laboratories....157
Wyeth Laboratories....189, 235

Young Dental Mfg. Co....206, 208



℞ For Your Practice

You face many problems in building and managing a successful dental practice. What you really need is a professional management consultant, one who has worked with many dentists, knows the problems of the dentist and will work out a solution for you. In your own office he'll work with you in analyzing your location, your office, potential patient load, your desires and objectives. Together, you'll work out a personal management program that will fit your needs and the needs of your practice.

"Doing it yourself" is fine for hobbies, but don't gamble with your dental practice. Find out how PBP will benefit your patient, your practice, YOU.

PROFESSIONAL BUDGET PLAN
303 E. Wilson St. Madison 1, Wisconsin

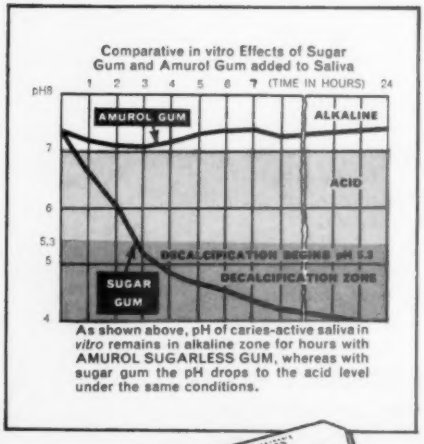
Please send me information on how PBP will benefit my practice.

Dr..... Street Address.....

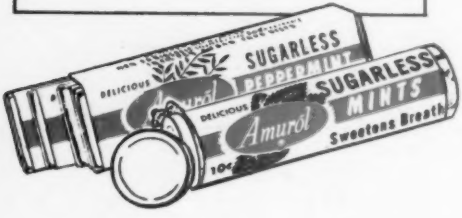
City..... Zone..... State.....

The best dental news of all...

(from the patient's viewpoint)



As shown above, pH of caries-active saliva in *vitro* remains in alkaline zone for hours with AMUROL SUGARLESS GUM, whereas with sugar gum the pH drops to the acid level under the same conditions.



IT's a happy visit when you at last report fewer dental caries . . . thanks to proper oral hygiene and sugar restriction.

For most patients the difficult part of the regime is sugar abstinence. Yet a stick of delicious Amurol Sugarless Gum or a sweet, refreshing Amurol Mint does satisfy that "sweet tooth"—without promoting caries.

So bring some joy to caries-active patients —recommend Amurol. Available everywhere in a variety of flavors.

Amurol®

SUGARLESS "SWEETS"

Amurol samples and patient literature are available upon request.

AMUROL PRODUCTS CO. NAPERVILLE, ILLINOIS

Crescent Pellets

bring you ALL of the advantages you are accustomed to in filings plus the fact that they help to speed up the amalgam procedure, conserve chairtime and avoid waste . . .

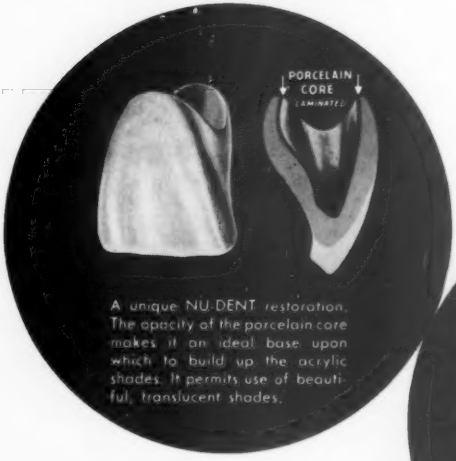
You have a choice: Cresilver Pellets, "the King of dental alloys," that contains the highest practical silver content (74½%) of any available today; or Silverloy Pellets, "the favorite silvery white amalgam alloy."

Formula for better fillings: 2 pellets of Cresilver or Silverloy. 2 twists of the Crescent Mercury Dispensor. 12 seconds mix on the Wig-l-bug.

Remember you get a FREE Crescent Mercury Dispensor (designed especially for use with pellets) with every 10 ozs of Cresilver Pellets @ $24.25, or 10 ozs of Silverloy Pellets @ $20.75. Call your dealer today.

CRESCENT DENTAL MFG. CO.
1839 South Pulaski Road, Chicago 23, Ill.

PORCELAIN-LINED ACRYLIC JACKETS



A unique NU-DENT restoration. The opacity of the porcelain core makes it an ideal base upon which to build up the acrylic shades. It permits use of beautiful, translucent shades.

PORCELAIN JACKET CROWNS

Exquisitely beautiful reproductions of the natural teeth . . . carved with consummate skill . . . and stained for depth and naturalness.

NU-DENT

(Reg. U.S. Pat. Off.)

VACUUM BAKED *for Beauty*

VACUUM BAKED *for Strength*

NU-DENT's specially formulated porcelains and acrylics are VACUUM BAKED in exclusive patented NU-DENT furnaces to add greater strength and resistance to wear!

Write to the studio nearest you for detailed information on NU-DENT Porcelain-Lined Acrylic Jackets, Porcelain Jacket Crowns and other NU-DENT practice-building developments.

nu-dent PORCELAIN STUDIO, INC.

220 W. 42 St., N. Y. LA 4-3591, 2, 3, 4, 5, 6 • 9615 Brighton Way, Beverly Hills, Cal. CRestview 5-8717